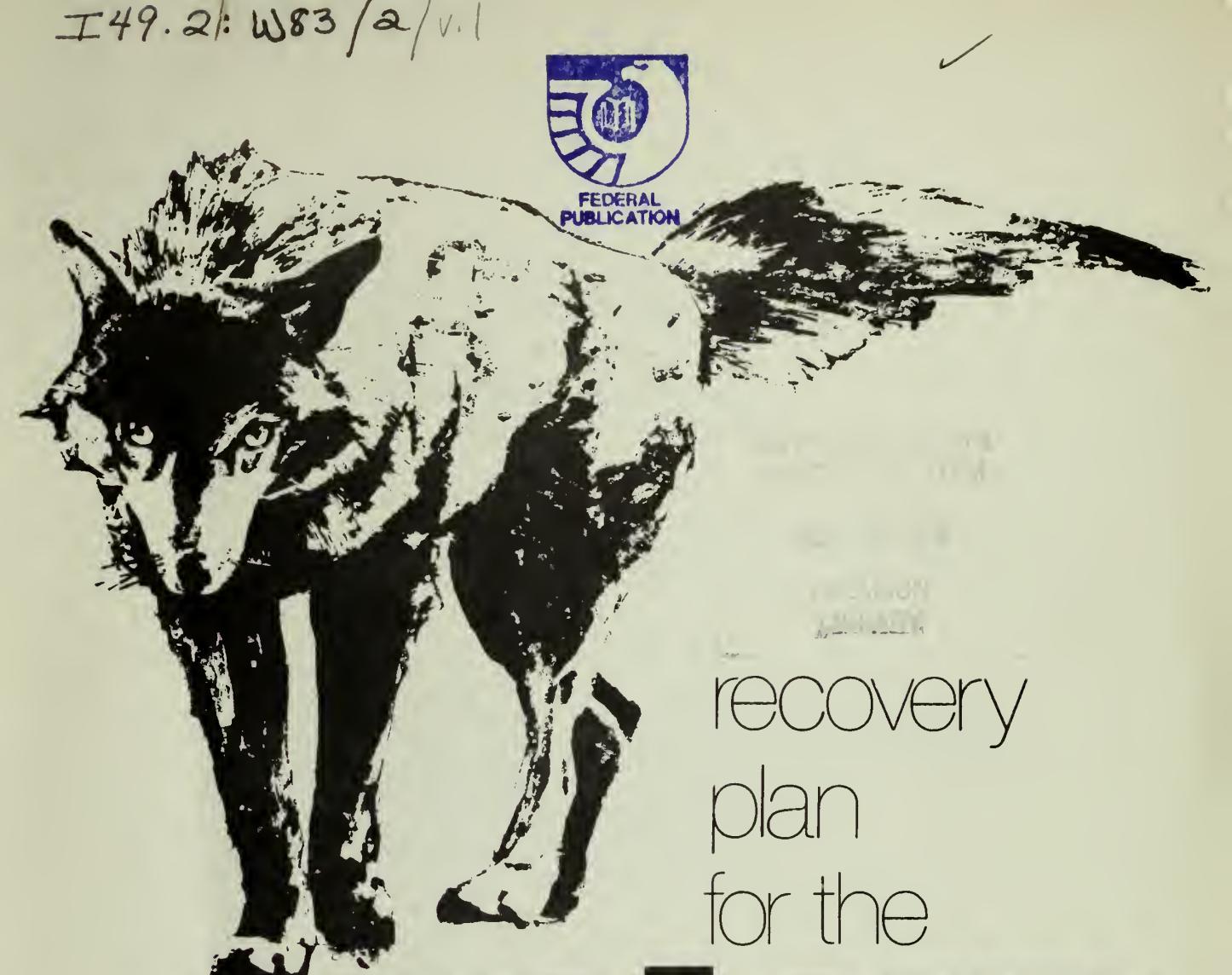




FEDERAL  
PUBLICATION



A high-contrast, black and white photograph of a timber wolf standing in a snowy or light-colored, open landscape. The wolf is facing slightly to the left, with its head turned towards the viewer. Its dark fur is in sharp contrast to the lighter background. The terrain appears rugged and uneven.

recovery  
plan  
for the

# eastern timber wolf



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EASTERN TIMBER WOLF  
RECOVERY PLAN

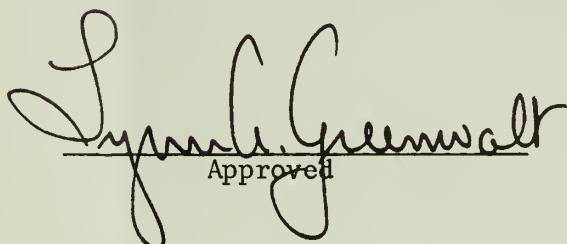
Prepared by Eastern Timber  
Wolf Recovery Team

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Mr. William C. Hickling, U.S. Fish and Wildlife Service  
Mr. Ron Nicotera, Wisconsin Department of Natural Resources  
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Mr. Robert M. Linn, National Park Service  
Mr. Robert E. Radtke, U.S. Forest Service  
Mr. Karl Siderits, U.S. Forest Service

  
Lynne Greenwalt  
Approved

06 - 05 - 78  
Date





# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR,  
FISH AND WILDLIFE SERVICE

In Reply Refer To:  
FWS/OES 310.6

**RECEIVED**  
MAY 8 - 1978  
FISH & WILDLIFE SERVICE  
TWIN CITIES, MN

MAY 2 1978

Memorandum

To: Regional Director - Region 3  
From: Director  
Subject: Eastern Timber Wolf Recovery Plan

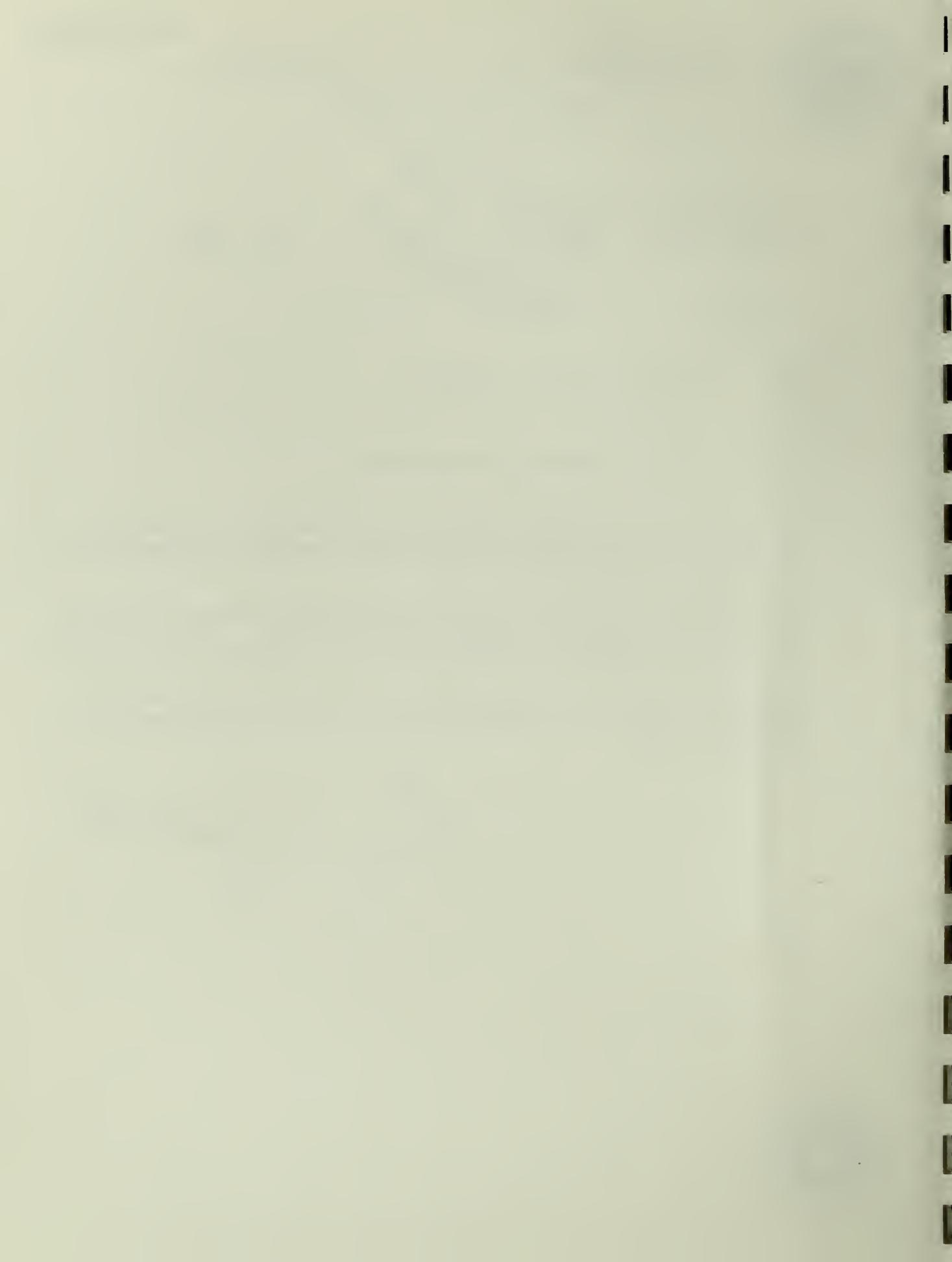
Based upon your memorandum of March 10, 1978, requesting a decision, we approve the Eastern Timber Wolf Recovery Plan after incorporation of our comments dated December 9, 1977.

This plan, as with all Recovery Plans, is a dynamic document and should be revised as necessary as stated in the Guidelines. "Each plan will be updated as needed to incorporate new facts, techniques, and objectives."

You may disregard the last paragraph in our December 9 memorandum and forward 25 copies of the completed plan to us for dissemination at the Washington level.

*Sympa. Greenwald*







# United States Department of the Interior

ADDRESS ONLY THE DIRECTOR,  
FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE SERVICE  
WASHINGTON, D.C. 20240

In Reply Refer To:  
FWS/OES 310.6

DEC 9 1977

## Memorandum

To: Regional Director, Region 3  
<sup>Acting</sup>  
From: Director  
Subject: Eastern Timber Wolf Recovery Plan

We have reviewed the subject plan and are providing the following comments for consideration in the "Agency Review Draft".

### General Comments

We agree with your third paragraph on page 8 regarding the importance of a public information program. In fact, we believe that one objective in the step-down outline should be the development of such a program. Then all of the Information and Education factors which are fragmented throughout the plan could be concentrated and emphasized under one objective.

The Recovery Plan indicates on page 2 that human exploitation caused the reduction of the Eastern Timber Wolf population in the United States. Therefore, it would seem that people management would be the primary program needed to restore the wolf. However, the main emphasis of the plan seems to be on increasing the prey base by timber cutting, controlled burning, and the reestablishment of the woodland caribou. The conduct of these operations in sufficient magnitude to have any appreciable effect on the wolf population may be cost prohibitive.

We doubt that additional research on the ecology, behavior, and habitat requirements of deer, moose, and beaver (#122-4 in step-down outline) would contribute materially to the recovery of the wolf.



Specific Comments

Page 5, first full paragraph, first sentence (4) - change the word "if" to "when".

Page 6, top of page - Replace the words "along with big game...." with the words "and consumptive and non-consumptive uses of the wildlife resources".

Page 6, second full paragraph - Delete last two sentences.

Page 7 - Delete this section. This recommendation should not be included in the Recovery Plan. It should be a separate action. The plan may reflect the need for consideration of reclassification.

Page 8, second paragraph, last sentence - Delete the words "Prudence dictates", capitalize "a", add the words "should be taken" after "approach".

Page 8, third paragraph, last sentence - Add the word "expected" after "the".

Page 10, number one - These population levels should be broken down and quantified.

Page 13, number 122-62 - Rewrite. For example, "Federal agencies will prepare Environmental Assessments and/or Environmental Impact Statements to evaluate project impacts on the wolf and initiate Section 7 Consultation on public lands."

Page 12, number 122-225 - This objective should be deleted or clarified to agree with number 122-222.

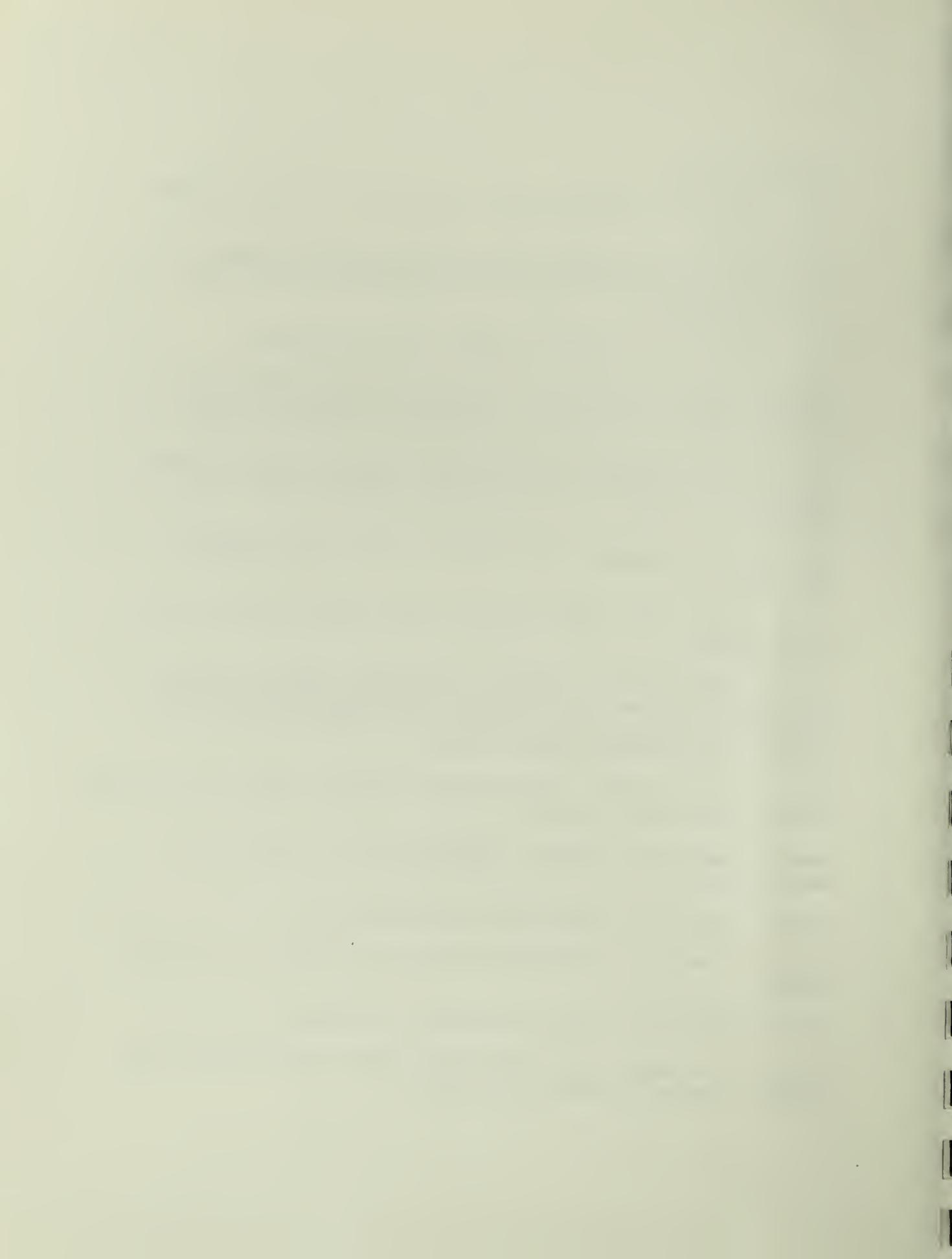
Page 15, number 22 - Rewrite. "Determine the feasibility of re-establishing E.T.W.".

Page 15, number 222 - Delete the words "and permit".

Page 15, number 23 - Add "through the use of related or non-related wolves".

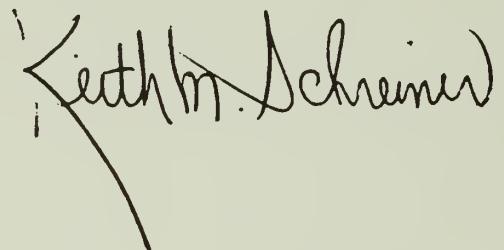
Page 15, number 231 - Change "hearings" to "meetings".

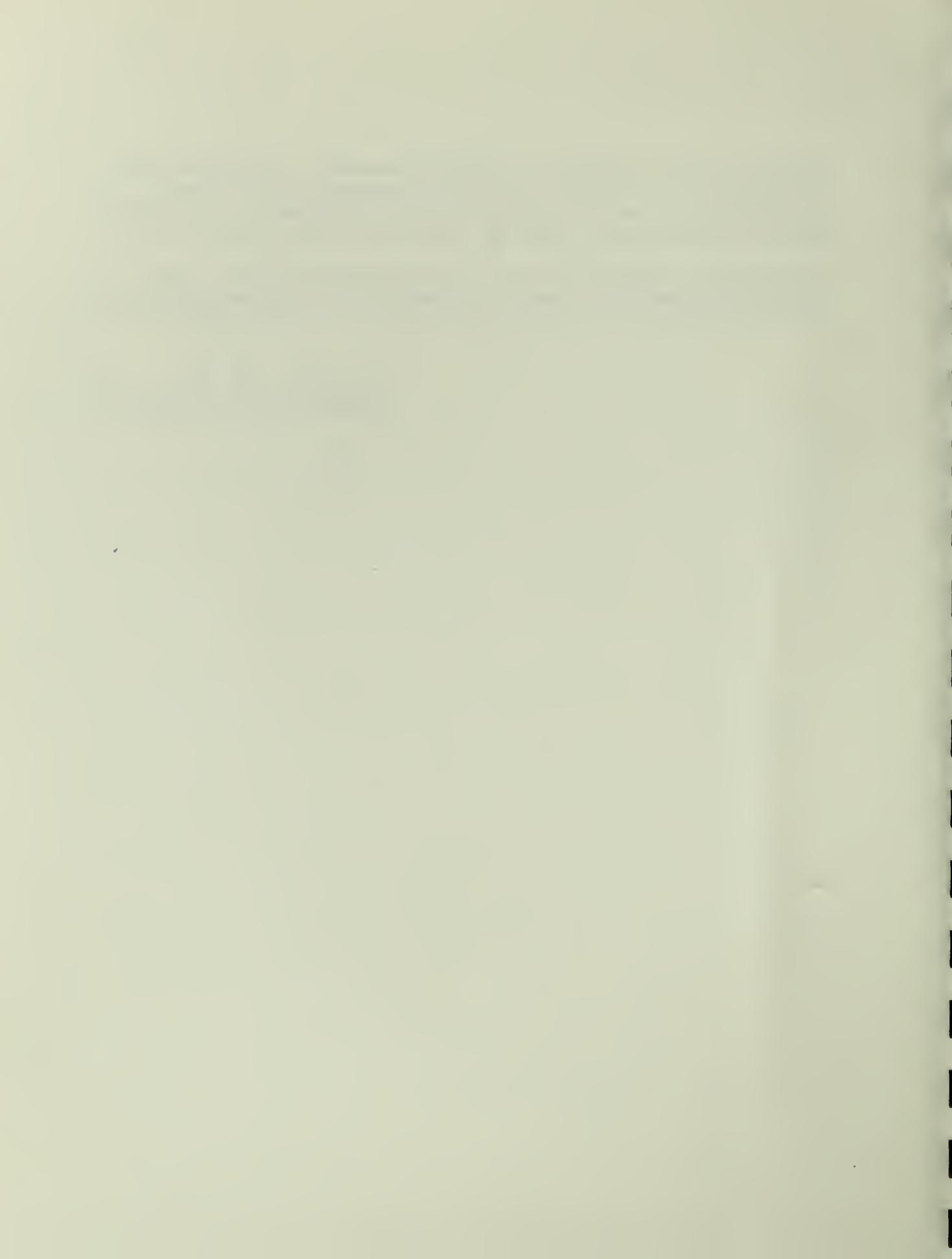
Page 15 - Add number 233, "Obtain permit from appropriate State and Federal agencies". Renumber accordingly.



Page 30 - Remove reference to "Critical Habitat". The Recovery Plan is not to be used for Critical Habitat recommendations. It may identify habitat essential to the survival of the species but Critical Habitat recommendations should be made separate from Recovery Plans.

We hope these comments will assist in completing the plan. Please forward the plan with letters of concurrence from implementing agencies and a title page for the Director's signature to signify approval.

A handwritten signature in black ink, appearing to read "Keith M. Schreiner". The signature is fluid and cursive, with a long horizontal line extending from the end of the "n" towards the bottom right.



# EASTERN TIMBER WOLF RECOVERY TEAM

P.O. Box 190  
Marquette, MI. 49855

May 16, 1978

Mr. Jack E. Hemphill  
Regional Director  
U. S. Fish & Wildlife Service  
Federal Building, Ft. Snelling  
Twin Cities, MN 55111

Dear Mr. Hemphill:

Thank you for the December 9, 1977 review of our draft recovery plan for the eastern timber wolf. Following is our itemized response:

## General Comments

First paragraph - The development of an I & E program is considered in the stepdown outline; see item 121 and sub-items.

Second paragraph - We do not agree that because people problems caused wolf reduction "the primary program needed to restore the wolf" is people management. The team feels strongly that the nature of the wolf is such that it cannot inhabit areas of high human density regardless of any reasonable "people management" program. Therefore we emphasized preservation of the wolf in wild and inaccessible areas. This emphasis further supports the need for increasing the wolf's prey base in such areas. In many cases, coordination of timber management programs is not prohibitive in cost and does offer opportunities for habitat improvement.

Third paragraph - Because of the considerations discussed in paragraph 2, the team strongly believes that increased research on wolf prey would contribute materially to the recovery of the wolf.

Ralph E. Bailey, Leader  
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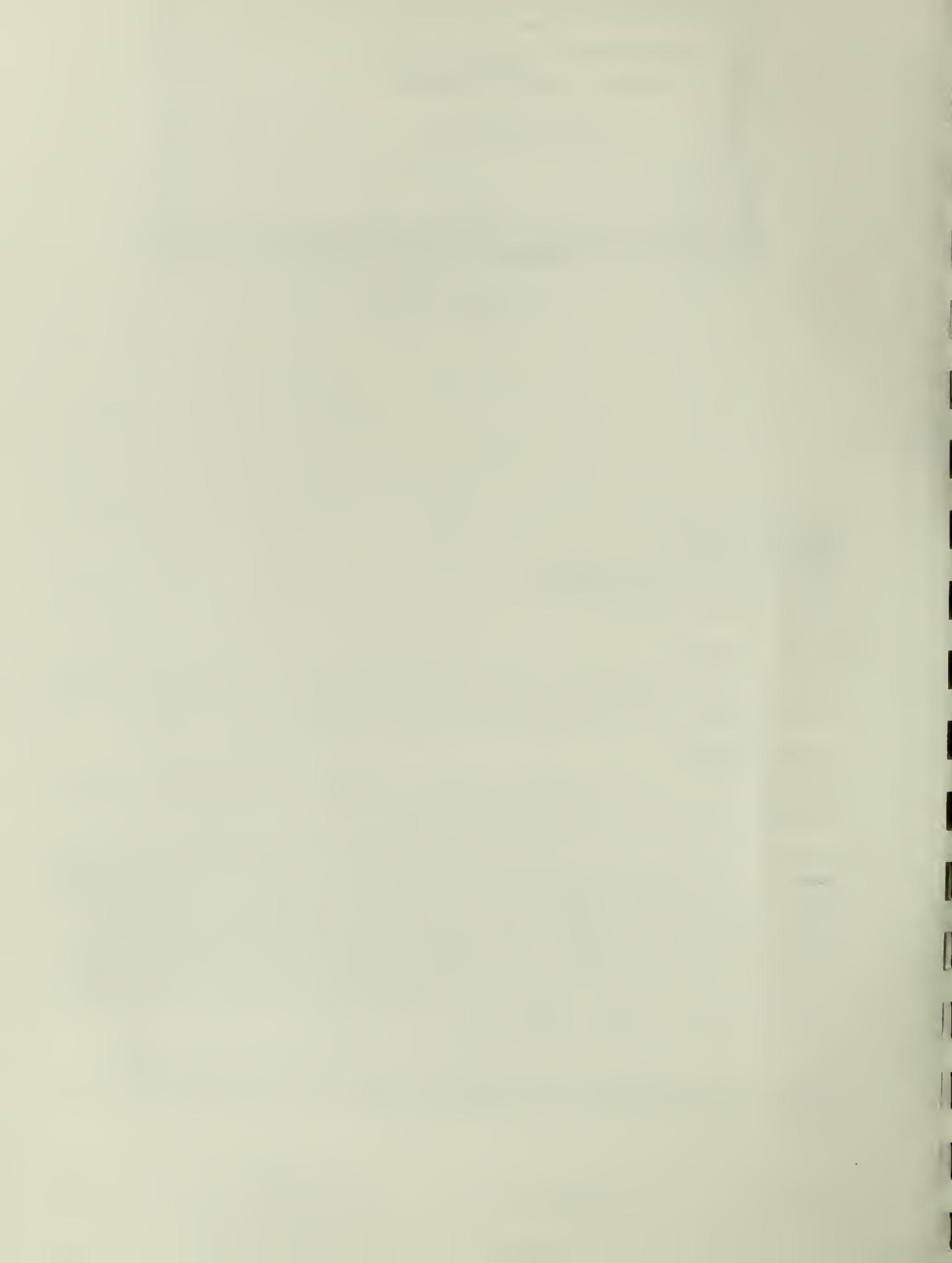
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L. David Mech  
U.S. Fish & Wildlife Service  
North Central Forest Experiment Station

Robert E. Radtke  
U.S. Forest Service  
Keweenaw Wilderness Area



Specific Comments - We accept the revisions in the December 9, 1977 memo with the following specific exceptions:

"Page 6, second full paragraph - Delete last two sentences." These sentences are important in completing the ideas put forth by the paragraph, namely, that deer, wolves, and deer hunters all benefit from habitat improvement. The last sentence deals with legal responsibility of non-endangered species belonging to the state. There may be disagreement on this item on a federal level, but the team feels very strongly on this issue.

"Page 7, delete this section." We cannot understand the rationale here. The team feels that this recommendation is a basic part of the plan. In fact, the Service has already adopted it. As of the date this plan was written page 7 was a basic part of the plan and should remain so until the first update.

"Page 10, number one - These population levels be broken down and quantified." This is in the plan - see 122-1, 122-2 and 123.

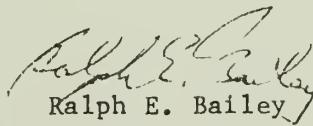
"Page 12, No. 122-225 - This objective should be deleted or clarified to agree with 122-222." These two items are both basic to 122-2 (Habitat). 122-222 deals with general improvement of hardwoods and conifers while 122-225 deals with winter habitat for deer and moose. These two items are independent of each other.

"Page 15, number 23 - Add 'use of related or non-related wolves'." The team believes this was in error and should read "through the use of packs or non-related wolves."

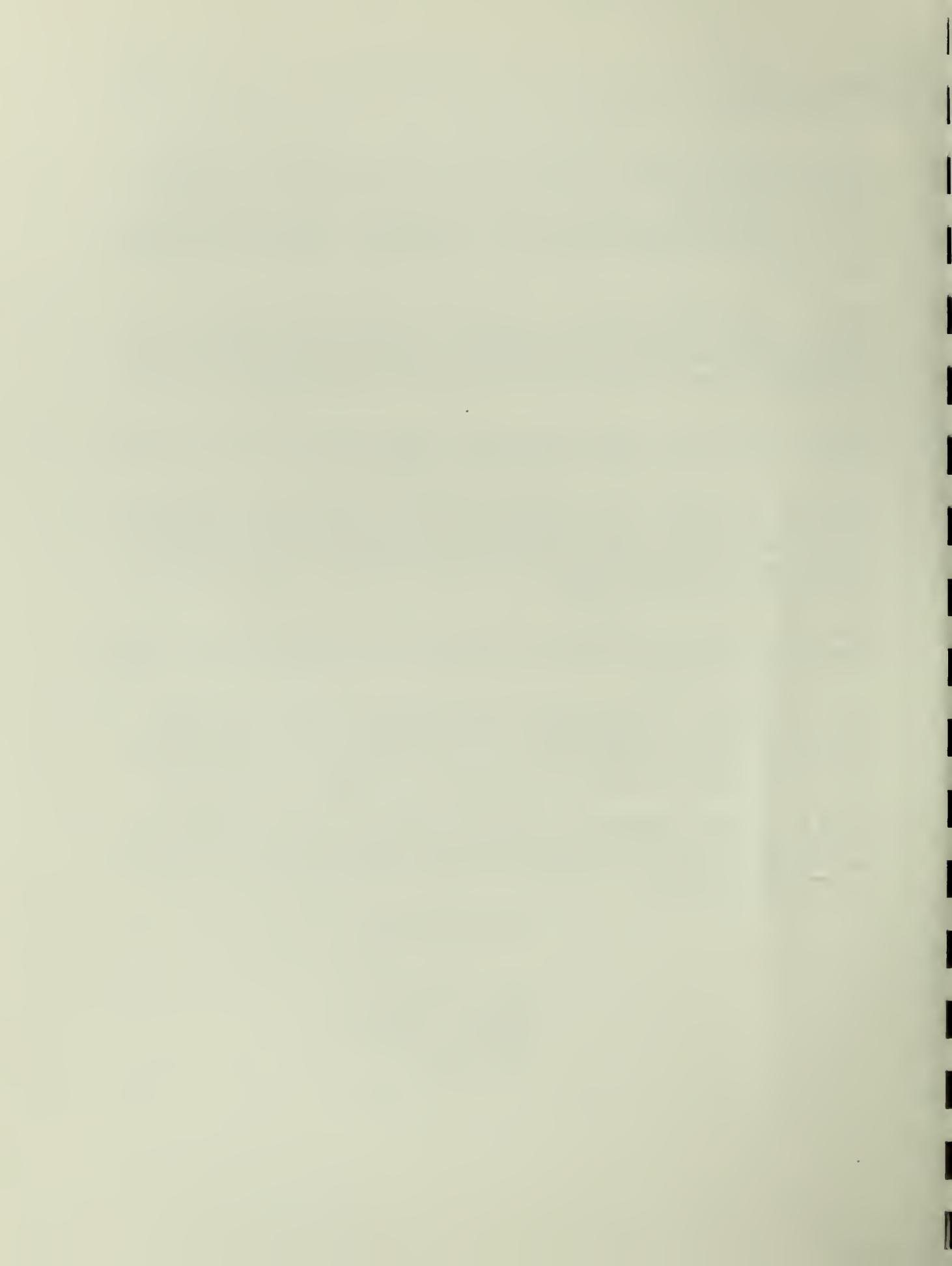
"Page 15, add 233, 'Obtain permit from appropriate State and Federal agencies'. Renumber accordingly." The team feels that state permits should stay under 222 rather than renumber several items to include permits under a separate number. The team is not adamant on this item.

"Page 30 - Remove reference to 'critical habitat'." The team was very careful not to mention "critical habitat" in this section. The plan does mention essential habitat and this is exactly what the team's intention was with this section.

Sincerely yours,



Ralph E. Bailey  
Team Leader



## PREFACE

This Recovery Plan for the Eastern Timber Wolf was prepared by the Eastern Timber Wolf Recovery Team appointed by the Director of the U. S. Fish and Wildlife Service. It is the result of a series of seven separate meetings of the team of from one to three days each, much correspondence, and hours and hours of individual effort on the part of team members.

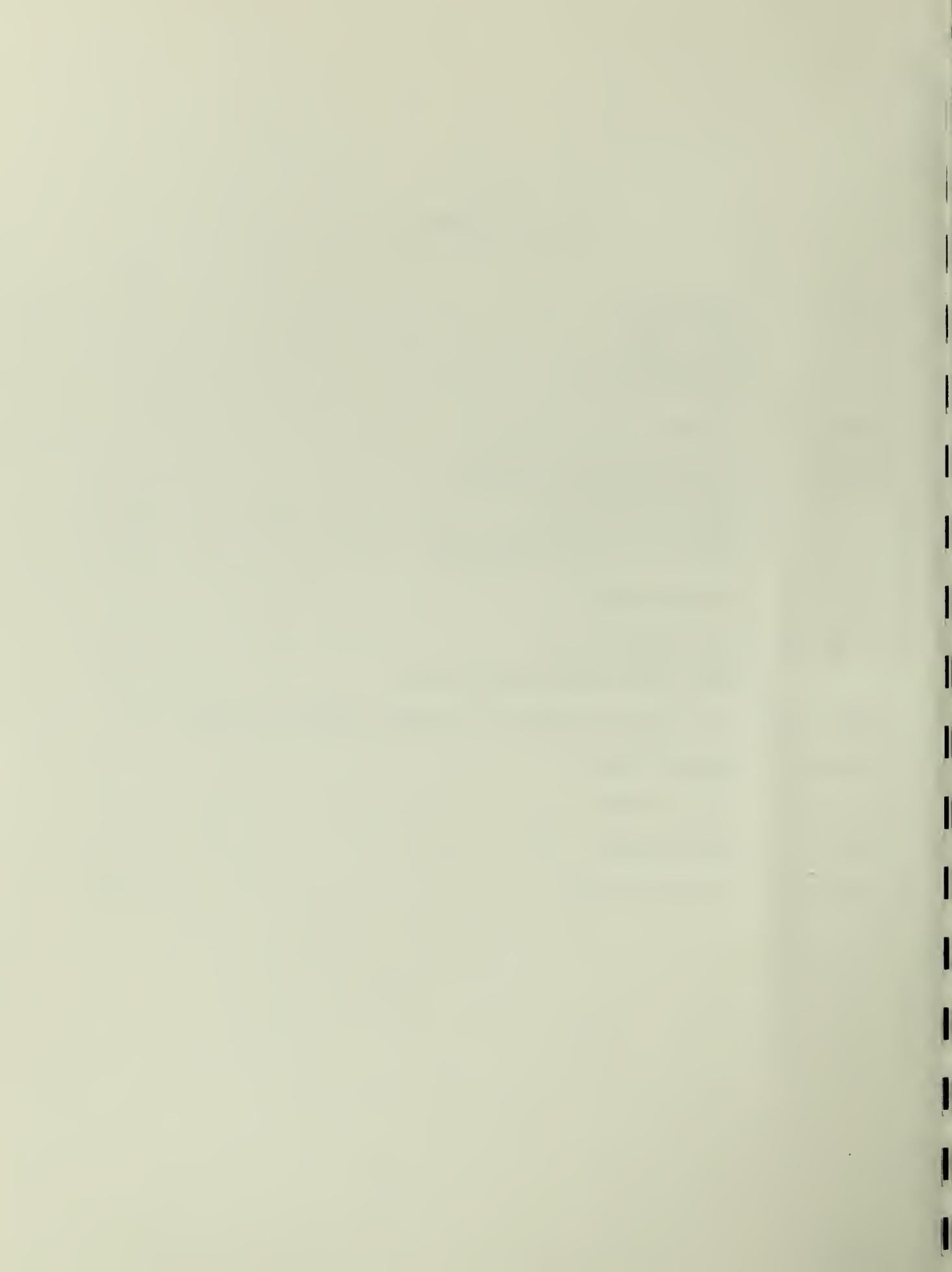
Our charge, as we understood it, was to devise an ecologically sound plan for the maintenance, enhancement and recovery of this subspecies throughout as much of its present and former range as feasible. We were to produce a plan that would be "a guide that delineates and schedules those actions required for securing or restoring an Endangered or Threatened species as a viable self-sustaining member of its ecosystem". Furthermore, we were instructed to produce a purely biologically based plan and to disregard possible political or social considerations. This we have done. Of course, with the wolf, which can interact with the interests of human beings, some biological considerations also have non-biological aspects. In such cases, there was no way to avoid considering these complex issues, for ultimately they could have a biological effect on the wolf population. Administrators involved with plan implementation will have to weigh social and political consideration at the appropriate time.

Review of the plan is called for annually, and revisions will be made as necessary.



## TABLE OF CONTENTS

	Page	
PART I.		
INTRODUCTION . . . . .	1	
Life History . . . . .	1	
Present Range . . . . .	2	
Range Restrictions . . . . .	4	
Critical Factors . . . . .	4	
PART II.	RECOMMENDED CLASSIFICATION . . . . .	7
PART III.	PLAN OBJECTIVES AND RATIONALE . . . . .	8
	Recovery Plan Outline . . . . .	10
	Recovery Plan Diagram . . . . .	17
	Schedule of Priorities, Responsibilities and Costs . . . . .	18
	Checklist of Necessary Actions . . . . .	26
PART IV.	CRITICAL AREAS . . . . .	30
APPENDIX A.	DESCRIPTION OF ZONES . . . . .	31
	MAP OF ZONES . . . . .	34
	QUANTITATIVE DESCRIPTION OF ZONES . . . . .	35
APPENDIX B.	PAST, PRESENT AND POTENTIAL EASTERN TIMBER WOLF RANGE . .	42
APPENDIX C.	BACKGROUND DATA . . . . .	46
APPENDIX D.	MINORITY REPORT . . . . .	56
APPENDIX E.	CORRESPONDENCE . . . . .	59
APPENDIX F.	LITERATURE CITED . . . . .	78



## PART I

### INTRODUCTION

The Eastern Timber Wolf (Canis Lupus lycaon) of eastern North America is one of 32 subspecies or geographic races of the gray wolf, 24 of which originally inhabited North America (Mech 1970). An increasing number of taxonomists believe that too many subspecies of North American wolves are recognized, and that the present number should be reduced (Rausch 1953, Jolicoeur 1959, Kelsall 1968, Mech 1974a). Nevertheless, the latest published taxonomic revisions still recognize the Eastern Timber Wolf as a separate subspecies.

Originally, the Eastern Timber Wolf occurred throughout most of the eastern United States and southeastern Canada (Appendix B). At present, the U. S. population remains only in Minnesota, Michigan and Wisconsin, comprising about 3% of its original range. The subspecies is still common throughout most of its original Canadian range. In 1967, the Eastern Timber Wolf was listed by the U. S. Secretary of the Interior as "endangered" in the U. S. The Superior National Forest lands of Minnesota were closed to the taking of wolves in 1970, and in August 1974, the subspecies was legally protected by the Federal Endangered Species Act of 1973. Wolves had been protected by State law in Michigan since 1965 and in Wisconsin since 1957.

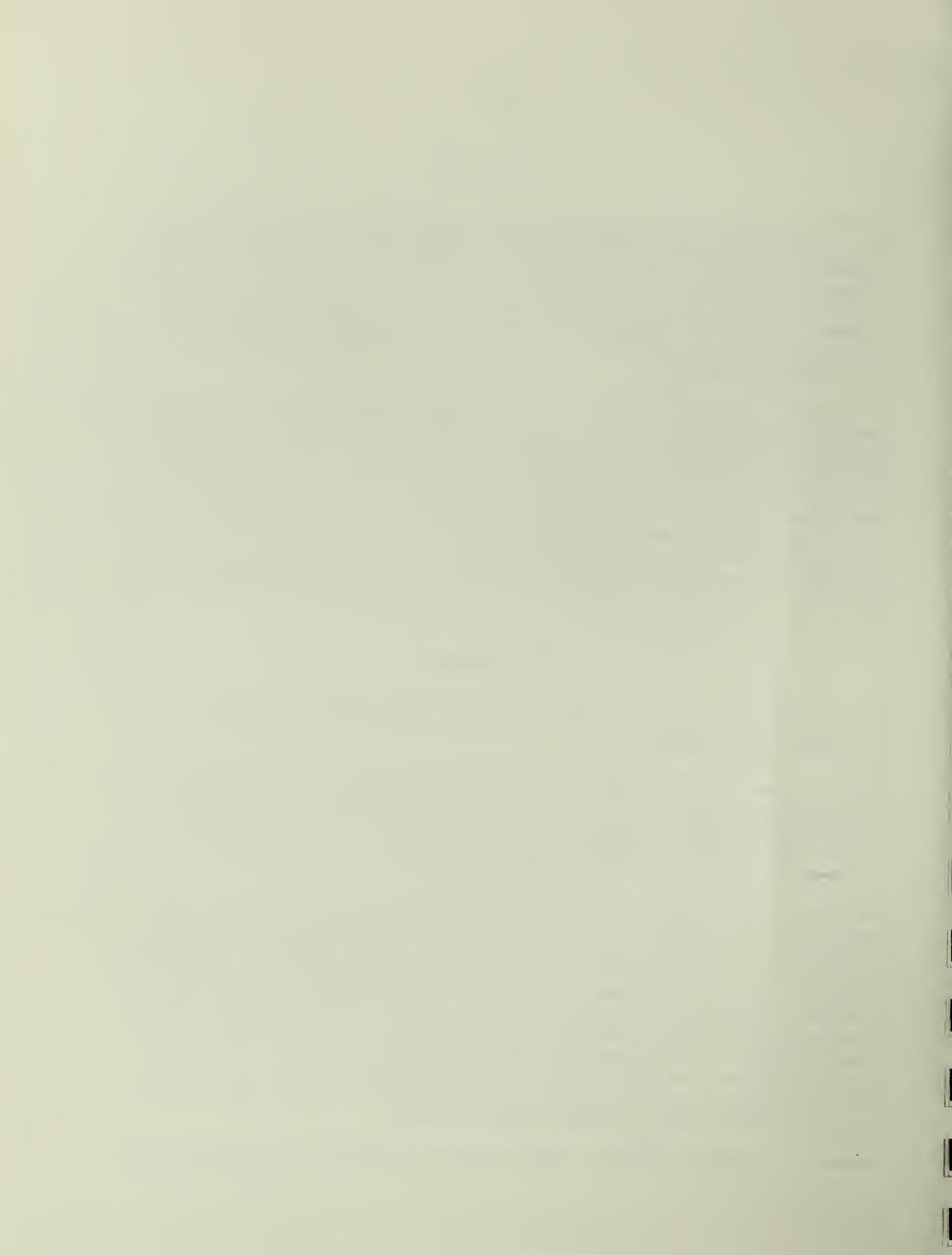
### Life History

The following information about the Eastern Timber Wolf was condensed from Mech (1970, 1974a).

Eastern Timber Wolves generally weigh 50 to 100 pounds in adulthood with males averaging heavier than females. They are usually mixed gray, but a small percentage are black or white (Mech and Frenzel 1971). Most wolves live in family groups or packs consisting of 2 to 8 members, although packs of up to 21 have been reported.

Each pack inhabits an area of 50 to 120 square miles or more and tends to be territorial. There is a dominance hierarchy within each pack, and usually only the top ranking male and female breed. Pups are produced in late April or early May, and under good conditions litter sizes average 5, with heavily exploited populations producing an average of 6.5 young. Some pups remain with the pack, and others leave the territory before or upon maturing. These independent animals become lone wolves and either live nomadically over areas of 1,000 square miles or more, or disperse out of the area, sometimes as much as 130 miles. If they find a member of the opposite sex and suitable range unoccupied by other wolves, they may settle down, mate, and begin their own pack.

Generally the prey of Eastern Timber wolves consists of white-tailed deer



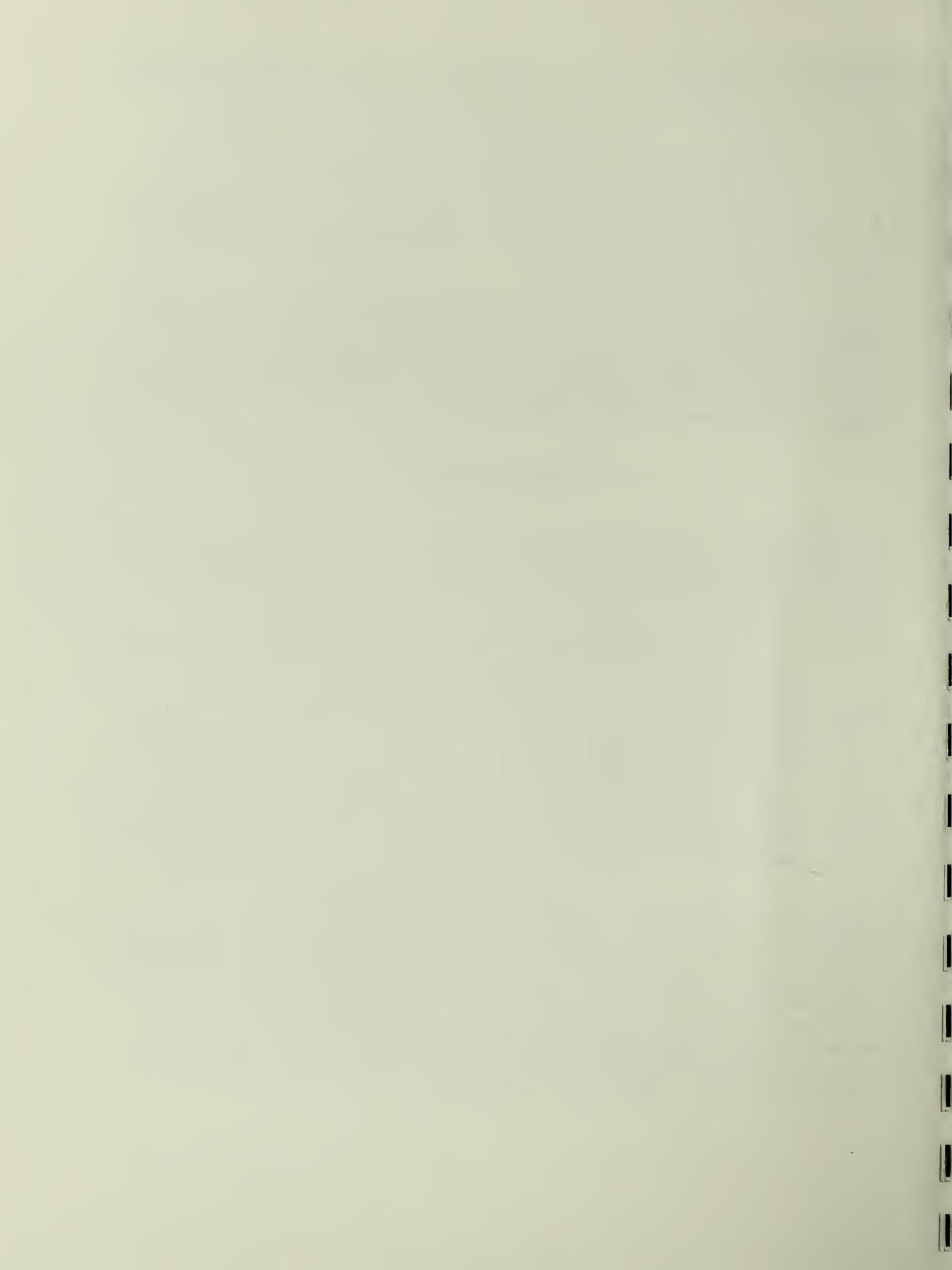
(*Odocoileus virginianus*), moose (*Alces alces*) or beaver (*Castor canadensis*), but they will also take domestic animals including dogs, sheep and cattle. Several studies indicate that generally wolves tend to kill old, sick, weak or disabled prey, and that the predators are not instrumental in causing prey declines. However, recently the wolf has been implicated in accenting a deer decline in Minnesota that apparently began as a result of deteriorating range and a series of hard winters (Mech, 1976; Hoskinson and Mech, 1976; Mech and Karns, submitted). Many human beings who live in wolf range resent the animal's predation on livestock and big game, and persecute wolves because of it, even despite State and Federal protective laws (Weise et al. 1975).

According to Goldman (1944) and Mech (1970), the reduction of the Eastern Timber Wolf population in the U. S. was caused by the following: (1) intensive human settlement of the land, (2) direct conflict with domestic livestock, (3) a lack of understanding about the animal's ecology and habits, (4) fears and superstitions about the animal, and (5) overzealous control programs designed to exterminate it.

#### Present Range

Thus, at present, the Eastern Timber Wolf in the U. S. is restricted to the northwestern corner of its original range, an area contiguous to the Canadian population and one of short growing season, rocky outcrops, muskeg, infertile soil, and low human density. The value of the wolf's present range for livestock production varies from zero to marginal. Within this region, the approximate number of wolves remaining in specific areas correlates well with the low density of humans in those areas (Weise et al. 1975). Wisconsin reports scattered wolf signs and sightings (Anderson and Thiel, 1975) and in August 1975, a wolf was killed by a car in Wisconsin near the Minnesota border. In Upper Michigan, an estimated 6 to 10 animals remain (Hendrickson et al. 1975), although more recent reports indicate these figures may be low (R. E. Bailey, personal communication). In Isle Royale National Park, Lake Superior, approximately 40 wolves inhabited some 210 square miles in 1975 (Peterson and Allen 1975). Northern Minnesota, being closest to the Canadian population and having the lowest human population density, harbors the most wolves. (Appendix B.)

A main focus, then, of this Recovery Plan, is on Minnesota. The wolf situation in that State is complex. When the Eastern Timber Wolf was placed on the secretary's list, little was known about the status of the animal in Minnesota. An estimated 350 to 700 individuals were thought to exist there, and their numbers were considered to be static or decreasing (Cahalane 1964). Since then, an intensive research program has been conducted on the wolf in that State, and a much clearer picture of the animal's status and ecology there has emerged (Mech and Frenzel 1971; Mech 1972, 1973, 1974b, 1975, 1976; Van Ballenberghe and Mech 1975; Van Ballenberghe et al. 1975; Seal et al. 1975).



Some 31,000 square miles of wolf range generally have been recognized in Minnesota, with 10,000 square miles being considered primary range. However, reappraisal of these ranges by the Team and careful measurement of the areas involved indicates that the wolf range should be redefined into five areas. We have designated two northeast areas of primary range, Zone 1 comprising 4,462 square miles and Zone 2 comprising 1,864 square miles; one northwest area of primary range, Zone 3 comprising 3,501 square miles; and one area of peripheral range, Zone 4 comprising 20,901 square miles. (see Appendix A)

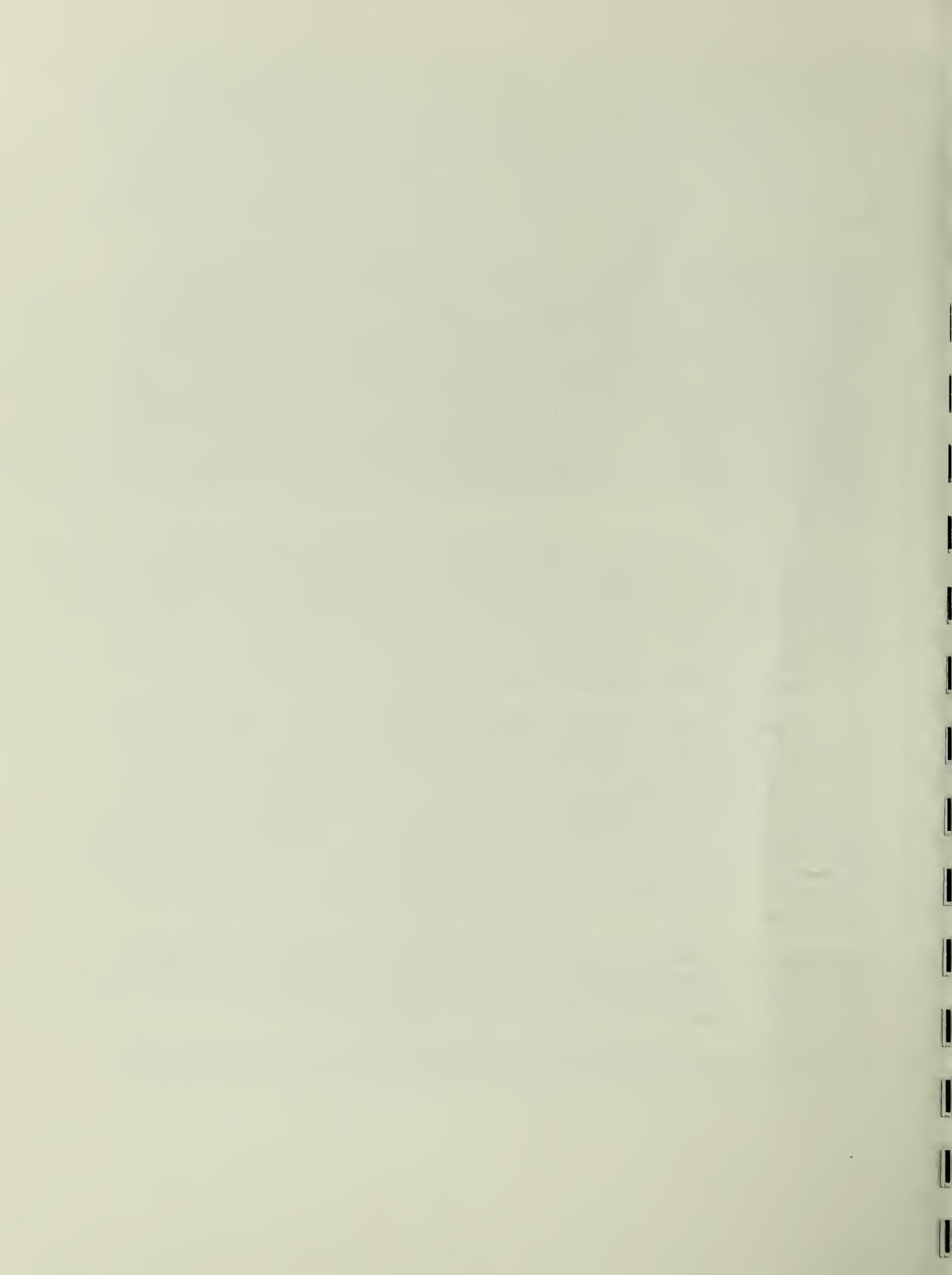
The northeast section of the primary range, which includes most of the Superior National Forest and its officially designated wilderness, the Boundary Waters Canoe Area (BWCA), recently appeared to be supporting as many wolves as it could ever support. This was certainly true of most of the Forest, where there were an estimated 400 wolves in winter 1971-72, or one wolf per 10 square miles (Mech 1973). Since then, however, the wolf population in the 1,000 square mile intensive sampling area of the Forest has declined by about 40% to one wolf per 17 square miles in 1974-75 (Mech, submitted), due to a drastic decline in numbers of deer (Mech and Karns, submitted). By 1975-76, however, they had increased by about 31% (Mech, submitted). Indications are that the number of wolves in the rest of the Forest have fluctuated similarly, although not necessarily to the same degree.

In the northwest section of primary range, wolf numbers have been low in recent years, but now appear to be increasing, probably as a result of the legal protection afforded by the Endangered Species Act of 1973. In winter 1974-75, there were an estimated 35 wolves present in a 1,000 square mile intensive sampling area in that section, or one wolf per 30 square miles (Fritts, unpublished). Prey populations appear to be adequate there to support more wolves, and wolf numbers are increasing.

The peripheral range generally lies south of the primary range, includes a much higher density of roads, farms and other human activities and constructions, and is highly accessible. There are few, if any, areas in the peripheral range that are not within 3 miles of developed roads. The density of wolves in the peripheral range is lower and much more variable than in the primary range. Unfortunately, less research has been conducted there, so density estimates are more speculative. All that is known is that wolves do occur throughout the area and that in one 100 square mile area southeast of Grand Rapids, the wolf density in 1974-75 was one per 13 square miles (Berg, unpublished).

Because of the settled nature of the peripheral range, it is the Team's opinion that attempts to maximize wolf numbers should be restricted to the primary range and that wolf populations in the peripheral range should be held at an average of one wolf per 50 square miles.

The variability and dynamic nature of wolf densities throughout various parts of northern Minnesota make it extremely difficult to arrive at an



accurate estimate of wolf numbers. Nevertheless, the Team believes the actual number of wolves in Minnesota is between 1,000 and 1,200 (Mech, Appendix C). This is greater than the estimate of 500 to 1,000 made by Mech and Rausch (1976) but is based on considerably more data than was available to those authors when their estimate was derived in 1973.

Just south of the peripheral wolf range is an area of greater accessibility and human density, including a high proportion of intensively farmed areas. Occasionally wolves dispersing from either the primary or the peripheral range (Mech 1972) find their way into this farming country and are killed.

#### Range Restrictions

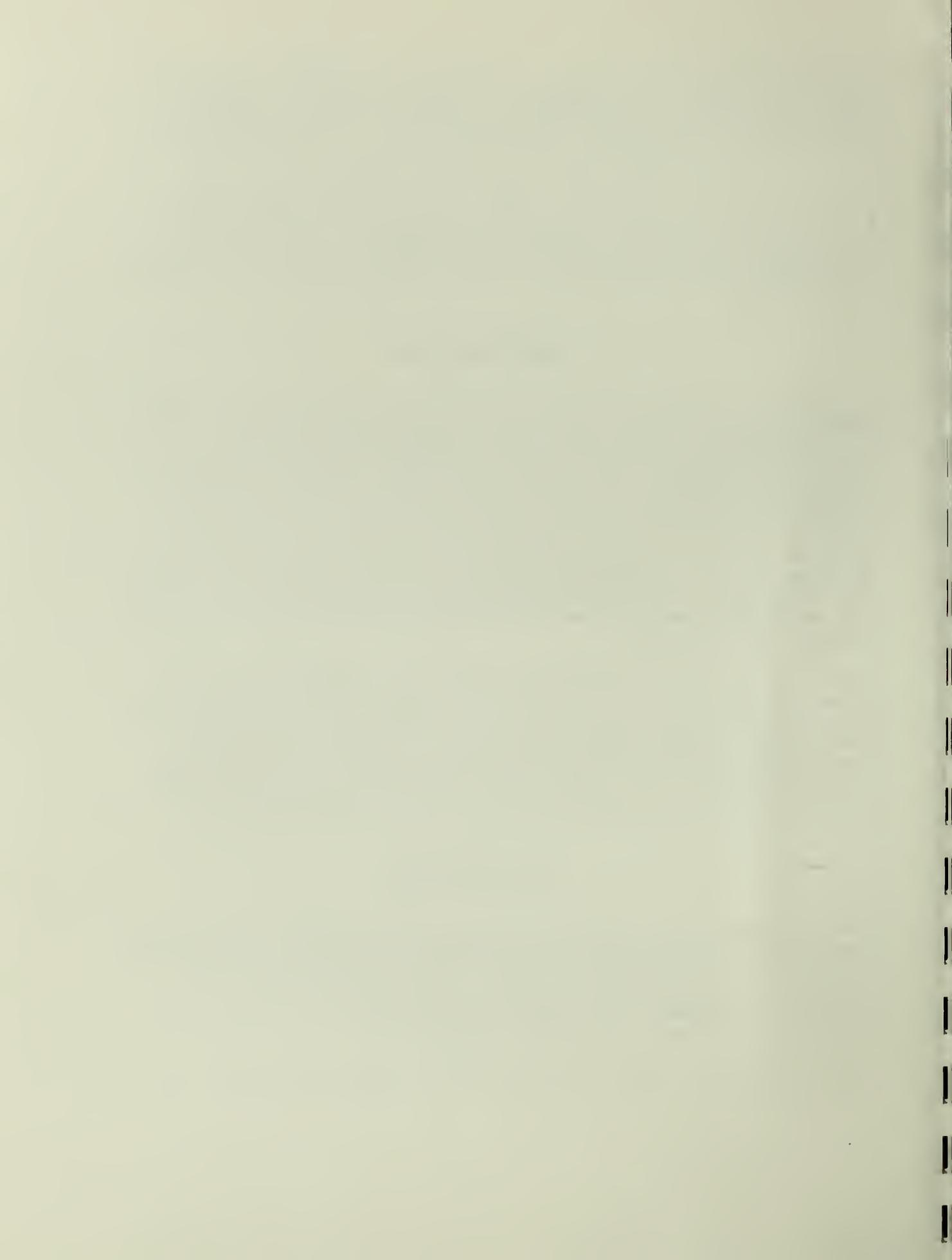
Apparently it is the human exploitation of wolves, legal and/or illegal, that has prevented their repopulation of Michigan and Wisconsin (Hendrickson et al. 1975; Weise et al. 1975) and the agricultural and highly settled regions of Minnesota (Mech 1973). Such exploitation probably also prevents saturation of the peripheral range in Minnesota. Through 1965 when records were available in Minnesota, an average of about 190 wolves per year were bountied there, and for many years an additional 50 to 60 were taken annually by State DNR employees. Since 1965 when the bounty was removed, exact figures have not been available, but, including wolves killed in the State's animal-damage-control program that replaced the bounty, a comparable number of animals are thought to have been taken each year.

Despite an annual kill of about 20 to 30% of the estimated number of wolves in Minnesota, there has been no noticeable decline in the State-wide population. This should not be surprising because it has been demonstrated in Alaska that annual harvests of 50% and more can be sustained by healthy wolf populations (Mech 1970:64). Conversely, the breeding potential of wolf populations with adequate prey is such that without mortality the population could at least double each year.

#### Critical Factors

Four main factors are critical to the long-range survival of the Eastern Timber Wolf: (1) availability of adequate wild prey, (2) large tracts of wild land with low human densities and minimal accessibility, (3) ecologically sound management, and (4) adequate understanding of wolf ecology and management. If not for the human element, only the first factor would be significant to wolf survival.

However, nowhere in the U. S., other than Isle Royale National Park, is



there an area where the Eastern Timber Wolf will not be affected by human activity. Isle Royale is unique in that hunting and trapping can be almost entirely controlled, whereas on the mainland, laws are difficult to enforce. Because of the diversity of human attitude, there will always be differences of opinion about the wolf. Wherever people reside in wolf country, they will have domestic livestock and/or pets, which may be subject to wolf attack. Thus, the combination of the other three factors becomes highly important.

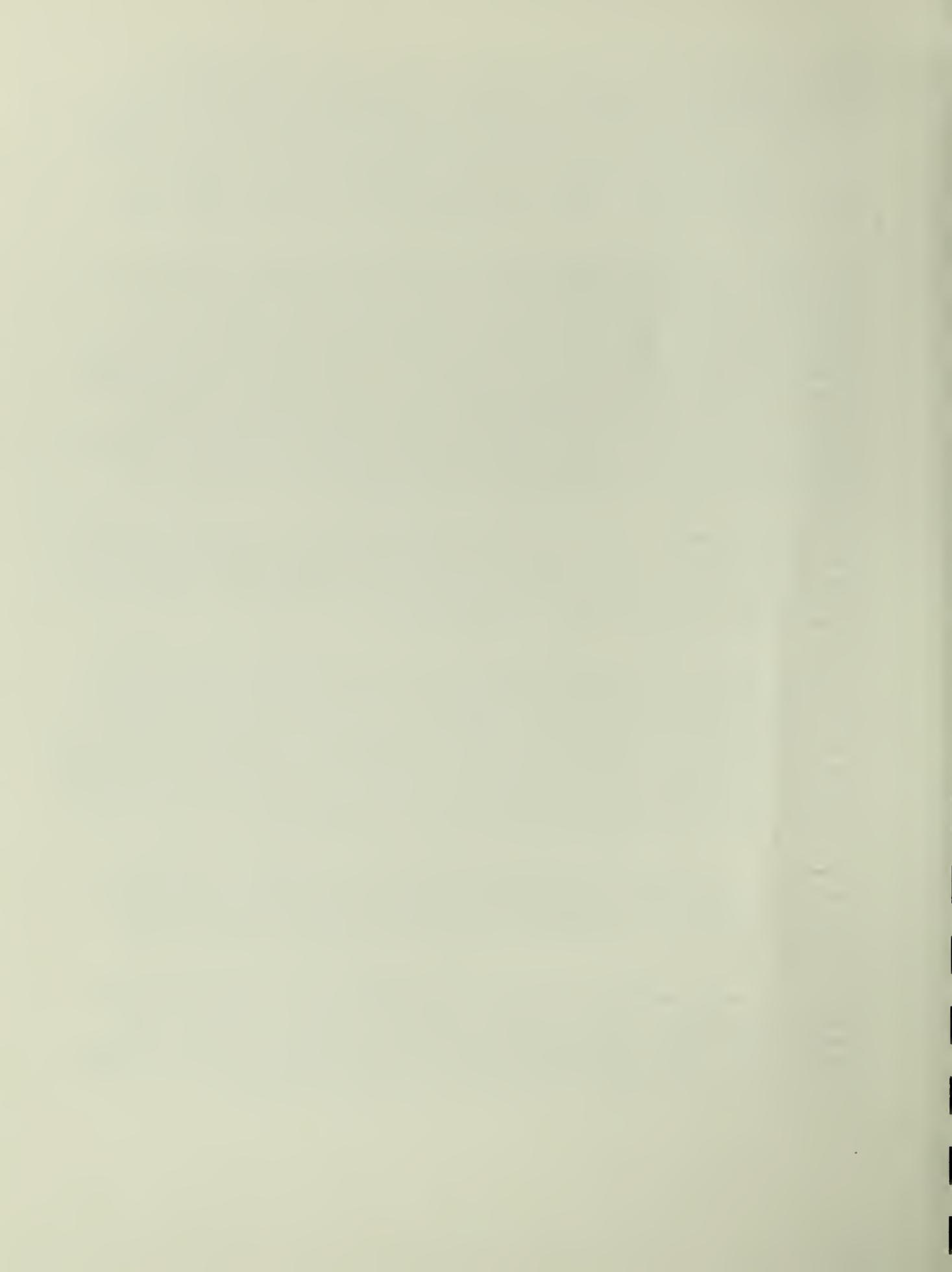
Ecologically sound management includes (1) protection where needed to help restore the Eastern Timber Wolf to areas of its original range and to preserve a naturally functioning population that can serve as a living museum, as a scientific subject, and as a reservoir to repopulate adjacent areas; (2) depredation control where wolves are killing domestic animals; (3) maintenance of wolf population densities at prescribed levels in semi-wilderness areas through a combination of protection and regulated taking, so as to minimize depredation on livestock, illegal killing of wolves, and vilification of the species; (4) restocking of wolves into suitable areas of their former range, when feasible; (5) continued research and monitoring of wolf populations; and (6) provision of adequate prey populations through adequate habitat improvement.

The Team recommends that in Minnesota complete protection should be afforded the wolf throughout its primary range (Zones 1, 2 and 3, Appendix A and B), except in specific cases of documented livestock depredation in Zones 2 and 3. Because livestock raising in the primary range is minimal, very little, if any, taking of wolves there is anticipated.

The need for a possible exception to this policy is recognized for Zones 2 and 3, however. It has been found that during a series of severe winters a wolf population can contribute strongly to the depletion of local deer herds (Mech and Karns, submitted), and then of itself be forced to decrease (Mech, submitted). Therefore, in order to help ensure that deer populations, and thus wolf numbers, remain high, the Team believes that if over any 3-year period deer numbers decline below those necessary to support one wolf per 10 square miles in Zones 2 or 3, consideration should be given to artificially reducing wolf numbers there until the deer herd recovers.

The same principle could also be applied to Zone 1. However, the Team feels that the value of this Zone for allowing wolf numbers to fluctuate naturally outweighs the advantage of trying to maintain wolves there at maximum densities. Nevertheless, this policy should be reviewed after five years.

One of the most important aspects of the Recovery Plan is the proposal for habitat improvement for prey species, especially deer. Generally deer habitat improvement means rejuvenation of mature forests through cutting and/or fire. Habitat improvement can be extremely expensive, but it should be emphasized that besides helping the wolf, such improvement will benefit



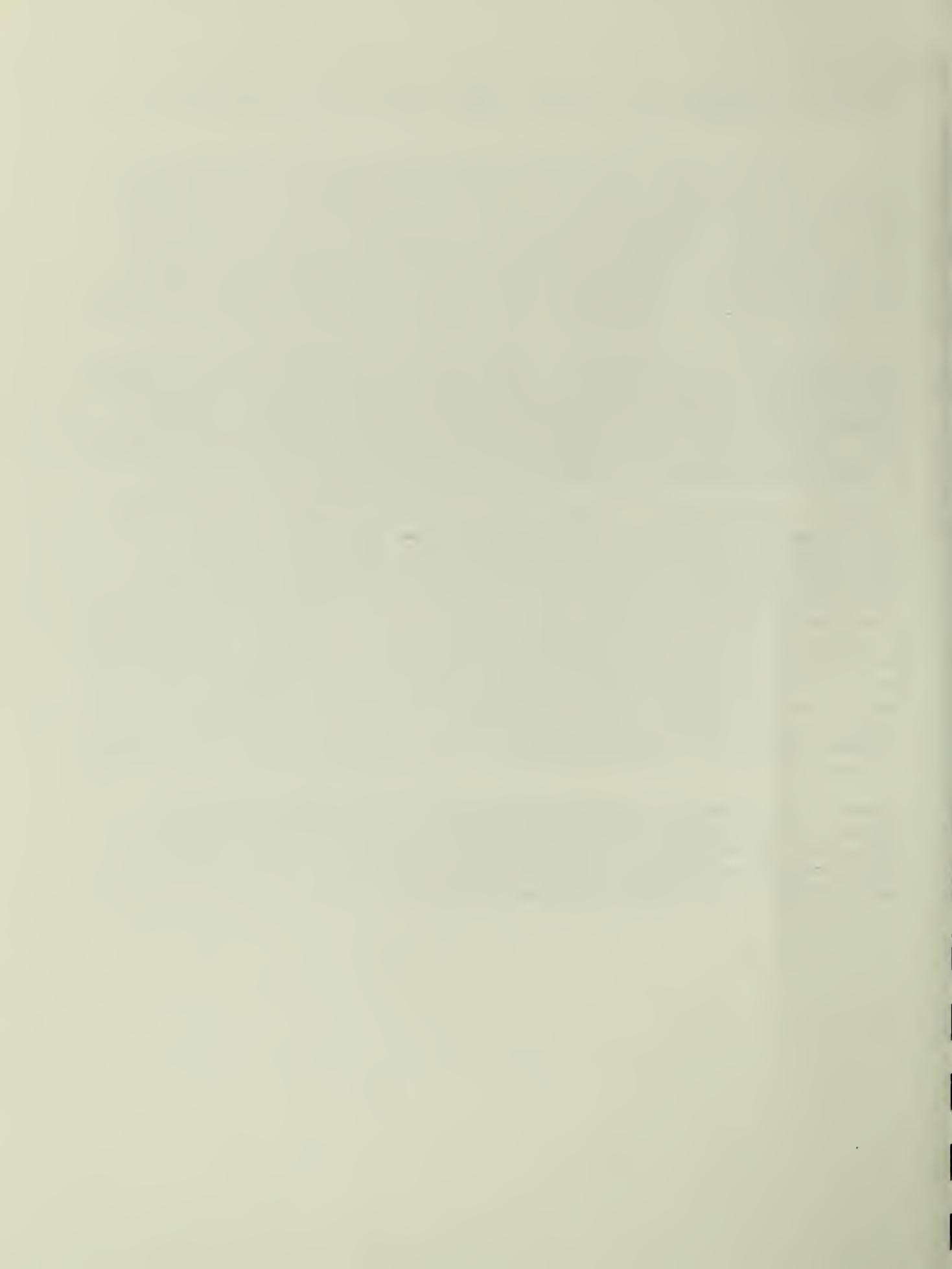
many other species of wildlife, and consumptive and non-consumptive uses of the wildlife resources. The high cost, then, should not be considered strictly for the benefit of the wolf.

It is also possible that under extreme circumstances, such as a series of severe winters, it may be biologically sound to temporarily reduce or prohibit harvesting of various prey species. Members of the Team have detected local public sentiment in favor of this approach as applied to deer, beavers, and moose. The intent of this sentiment was not to benefit the wolf but rather to help increase the numbers of the herbivores, and ultimately to benefit the humans that harvest them. However, restricted harvesting when prey numbers are below the carrying capacity of their range would also help benefit the wolf.

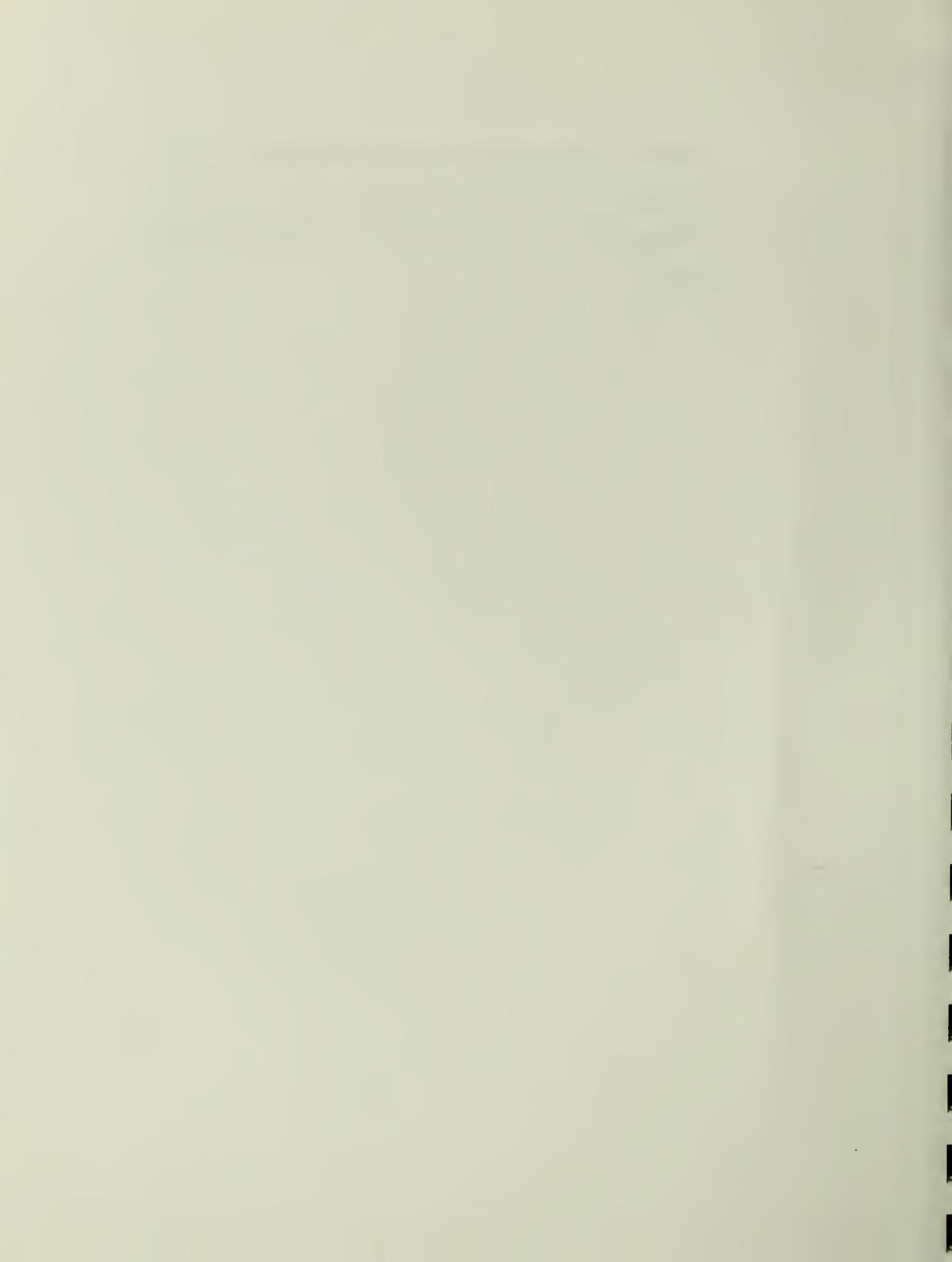
It has been brought to the Team's attention that such an approach can be misconstrued as a recommendation to "close the deer season to feed the wolves." However, since the Team was charged by the Department of Interior to consider only what would be best for the long range survival of the wolf, this means that the Wolf Recovery Plan should not necessarily consider the deer hunter, the forester, recreationist or anyone else. Those considerations will be made by administrators having input from both the Team and the general public.

In order to bolster the prey base of the Minnesota wolf population, the Team also recommends considering a re-establishment of the woodland caribou (Rangifer tarandus) as an alternate prey species. A remnant caribou herd inhabited Minnesota as recently as 1937, (Moyle, 1965) and a large amount of bog habitat similar to that in which the last herds lived is still present throughout much of northern Minnesota. With one more species of potential prey in various local areas, the Minnesota wolf populations would be less subject to decline if other prey species decreased. Of special interest as caribou habitat are the bog areas north of Upper Red Lake and southwest of International Falls, the "Hundred Mile Swamp," and the Culkin Lake area south of Babbitt. If a caribou re-establishment program is undertaken, it is possible that some measure of local wolf control would be necessary in early years to foster the re-establishment effort.

Because of the amount of misunderstanding about wolf ecology, population dynamics, and management, the Team recommends concerted efforts at public information and education. These efforts are necessary for the success of several aspects of the Plan. Without public support, based on accurate knowledge, the Plan will remain only a paper document.



Deleted. Reference memorandum dated December 9, 1977  
from Acting Director, U.S. Fish and Wildlife Service,  
to Regional Director, Region 3, U. S. Fish and Wildlife  
Service.



## PART III

### PLAN OBJECTIVES AND RATIONALE

This plan addresses itself to the four factors critical to the perpetuation of the Eastern Timber Wolf outlined above, through the following main objectives: (1) to insure the survival of the animal in Minnesota by highly regulated management, including the establishment of an 9,827 square mile sanctuary, and by extensive improvement of the habitat of its prey, (2) to attempt re-establishment of at least one viable population of Eastern Timber wolves outside Minnesota and Isle Royale. Both will require an intensive public education campaign designed to enlighten the public about the ecology and management of the wolf.

Because wolves have survived for so long in Minnesota despite bounties and year-around hunting and trapping, there may be a question as to why any restrictions need now be placed on the taking of the wolf. However, future circumstances are unpredictable and those that now exist could change drastically. For example, widespread industrialization, mineral exploitation, and general development could threaten much of the wolf's remaining range, making regulation increasingly significant to the populations left. Additional roads, railroads, power lines, mines and tourist facilities could further carve up much of northern Minnesota. This would disrupt the natural repopulation of depleted areas by wolves and promote higher human densities which could compete with wolves for their wild prey. A conservative approach should be taken when one is dealing with the last remaining stronghold of any subspecies.

Because there is so much misinformation disseminated about the wolf (Van Ballenberghe 1974) by both pro and anti-wolf advocates, it is imperative that a strong public information program be developed to explain wolf ecology and management. The expected result will be much greater public understanding and acceptance of an ecologically sound, scientific wolf management program.

For the present, it is important to remember that the wolf is controversial, so there will be local opposition to any attempt to re-establish the animal or afford it any measure of protection. Similarly there will be opposition from other quarters to any effort to control the animal, although control may be necessary for the good of the animal itself in certain areas. If re-establishment of the wolf is accomplished, regulated taking of the animal undoubtedly will be necessary in the restored range sooner or later (Mech, in press, b).

For those reasons, it is imperative that re-establishment of the wolf be undertaken only after a great deal of thought, background research, planning, and consultation with local people -- laymen as well as professionals. It must also be realized from the beginning that such investi-

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gations may indicate that re-establishment of the wolf may not be prudent.

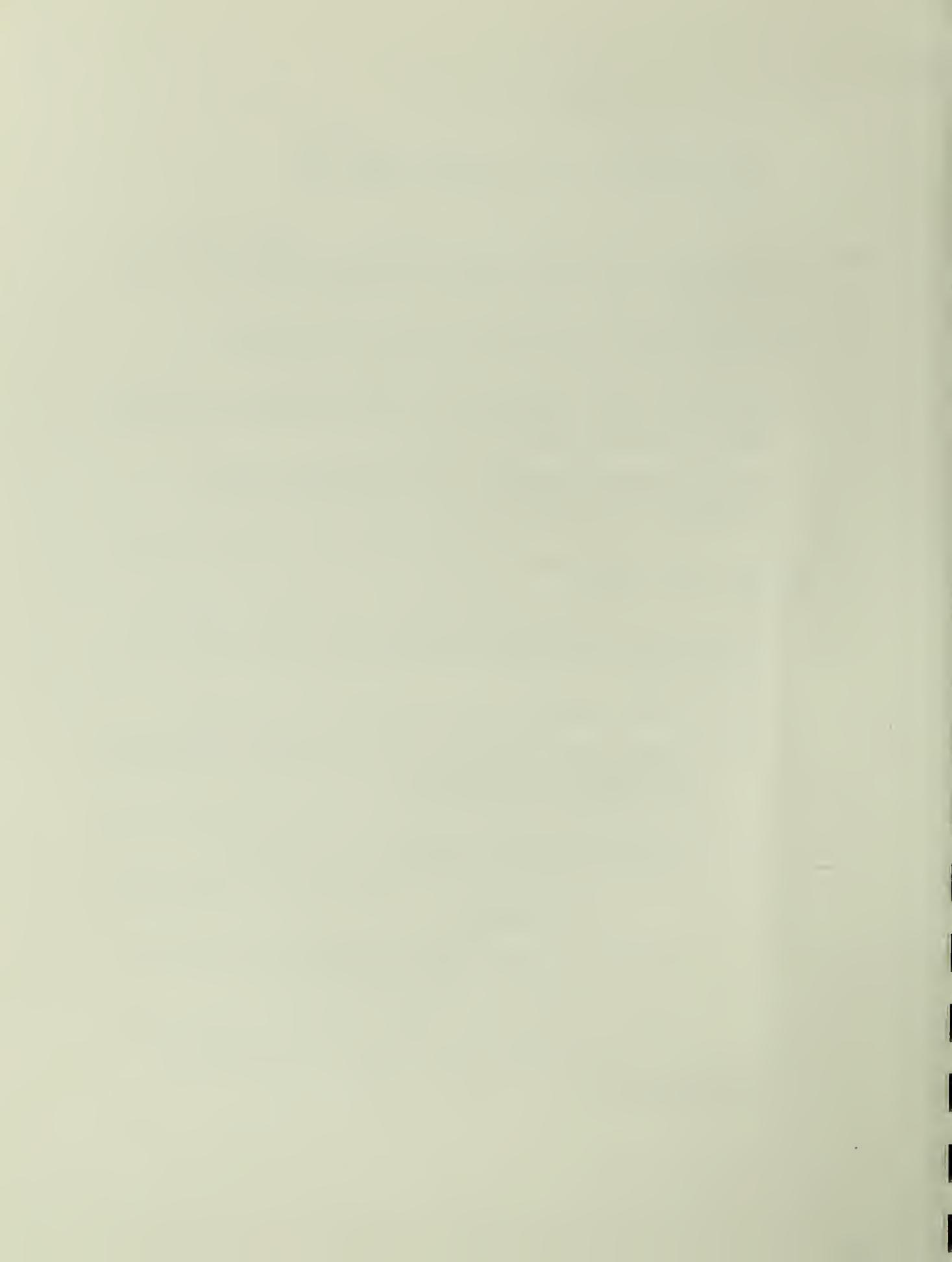
Nevertheless, it is important to explore all possibilities and to give the highest priority throughout this entire recovery plan to the biological and ecological considerations. They are the only ones that will be significant 100 years from now.



## Recovery Plan Outline

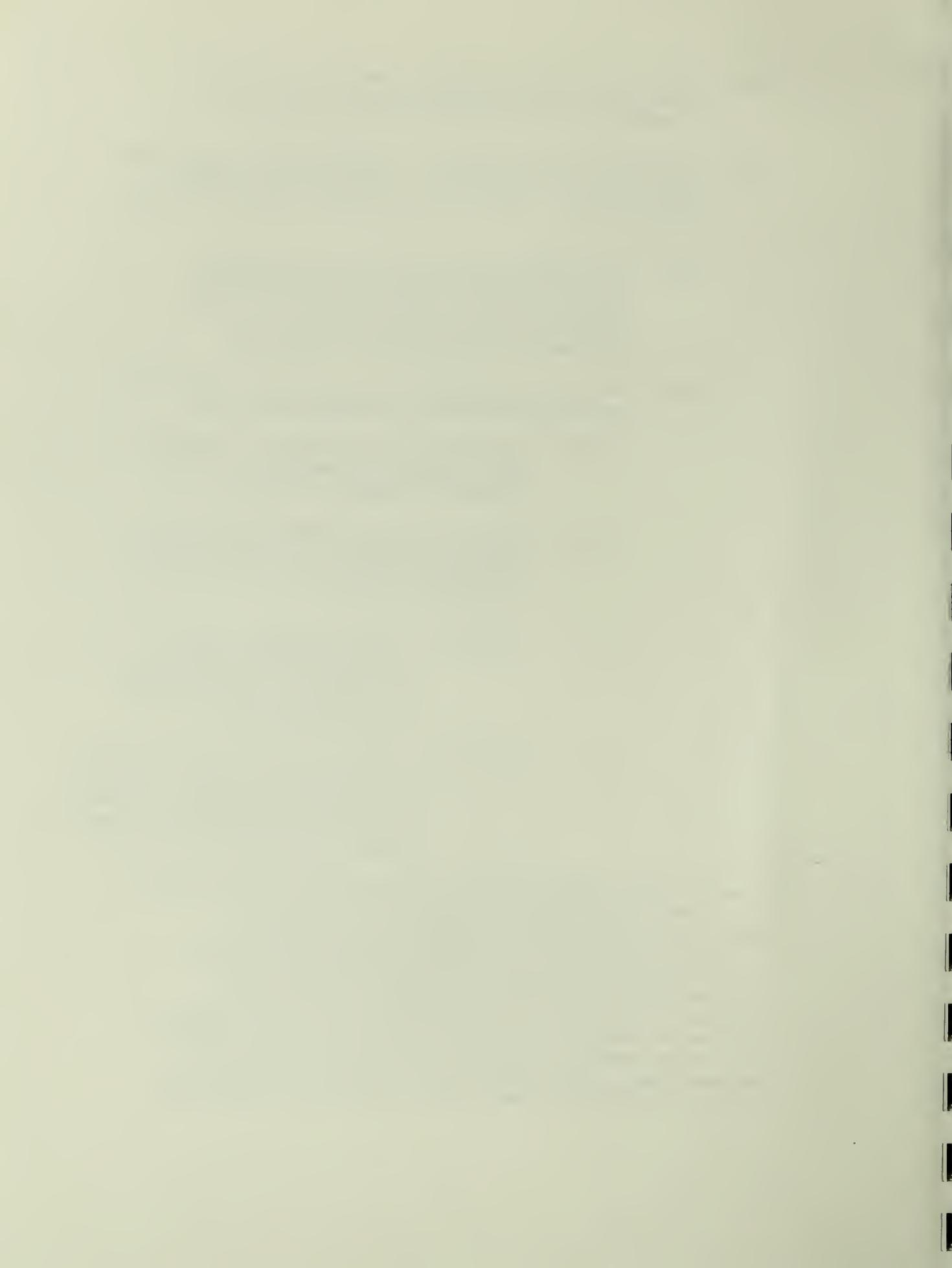
Primary Objective: Maintain and re-establish viable populations of the Eastern Timber Wolf in as much of its former range as is feasible

- 1 Insure perpetuation of the Timber Wolf population at levels optimum to the varying parts of its present Minnesota range (optimum level includes biological carrying capacity and compatibility with man)
  - 11 Review status of wolf populations in the various parts of the current range and readjust management plans as necessary
    - 111 Obtain accurate knowledge of Timber Wolf numbers, distribution, population trends, limiting factors, prey requirements, effects on prey including domestic animals
    - 112 Delineate distinct segments of the Timber Wolf range in Minnesota in relation to degree of suppression by man's activities
  - 12 Maintain Timber Wolf population at the determined optimum level on each part of the range
    - 121 Demonstrate to the public that the Minnesota wolf population is secure and that through ecologically sound management will remain secure
      - 121-1 Publish technical data available on wolf ecology
      - 121-2 Produce and distribute movies, TV programs, slide series and popular literature on the realities of wolf ecology and management in Minnesota
      - 121-3 Explain to interested groups and organizations the facts of wolf ecology and management in Minnesota
        - 121-31 Invite interested groups (pro, con and others) to conferences
        - 121-32 Invite biologists who have studied wolves in Minnesota to make presentation
        - 121-33 Invite press, outdoor writers, TV, radio, etc.
    - 122 Establish wolf sanctuaries with optimum wolf populations (see Appendix A)

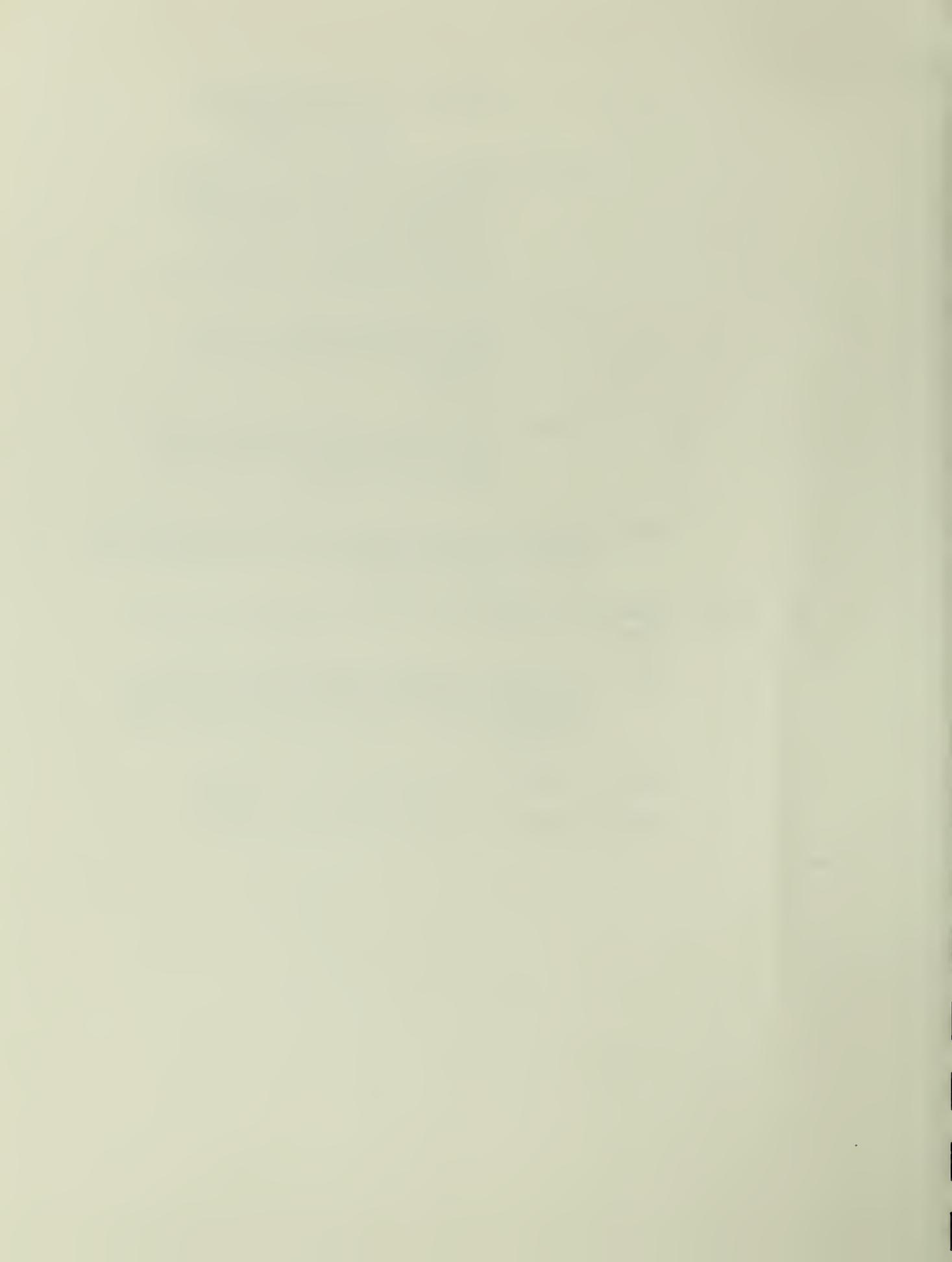


- 122-1 Allow wolf packs in Wilderness Sanctuary (Zone 1) to develop a natural social structure and fluctuate in numbers without wolf population management
- 122-2 Monitor and adjust habitat, and wolf and prey populations to achieve desirable balance in Managed Sanctuaries (Zones 2 and 3) (The goal for desired density of wolves is 1/10 sq. mi.)
- 122-21 Reduce wolf population if and when annual monitoring over a 3-year period indicates current population might over-utilize prey species and jeopardize maintenance of optimum wolf population in the future\*
- 122-22 Increase prey populations by habitat improvement or other appropriate management practices
- 122-221 Inventory forest acreage to determine conifer-hardwood composition in age classes and vegetation types
- 122-222 Promote adequate hardwood and conifer composition in age classes and types to provide for maintenance or improvement of forest diversity
  - 122-222-1 Promote logging practices to provide adequate supply, distribution and age classes of hardwoods, with emphasis on aspen and birch
  - 122-222-2 Design and carry out controlled burning and other site preparation practices to stimulate hardwood and conifer regeneration, especially aspen and birch where possible

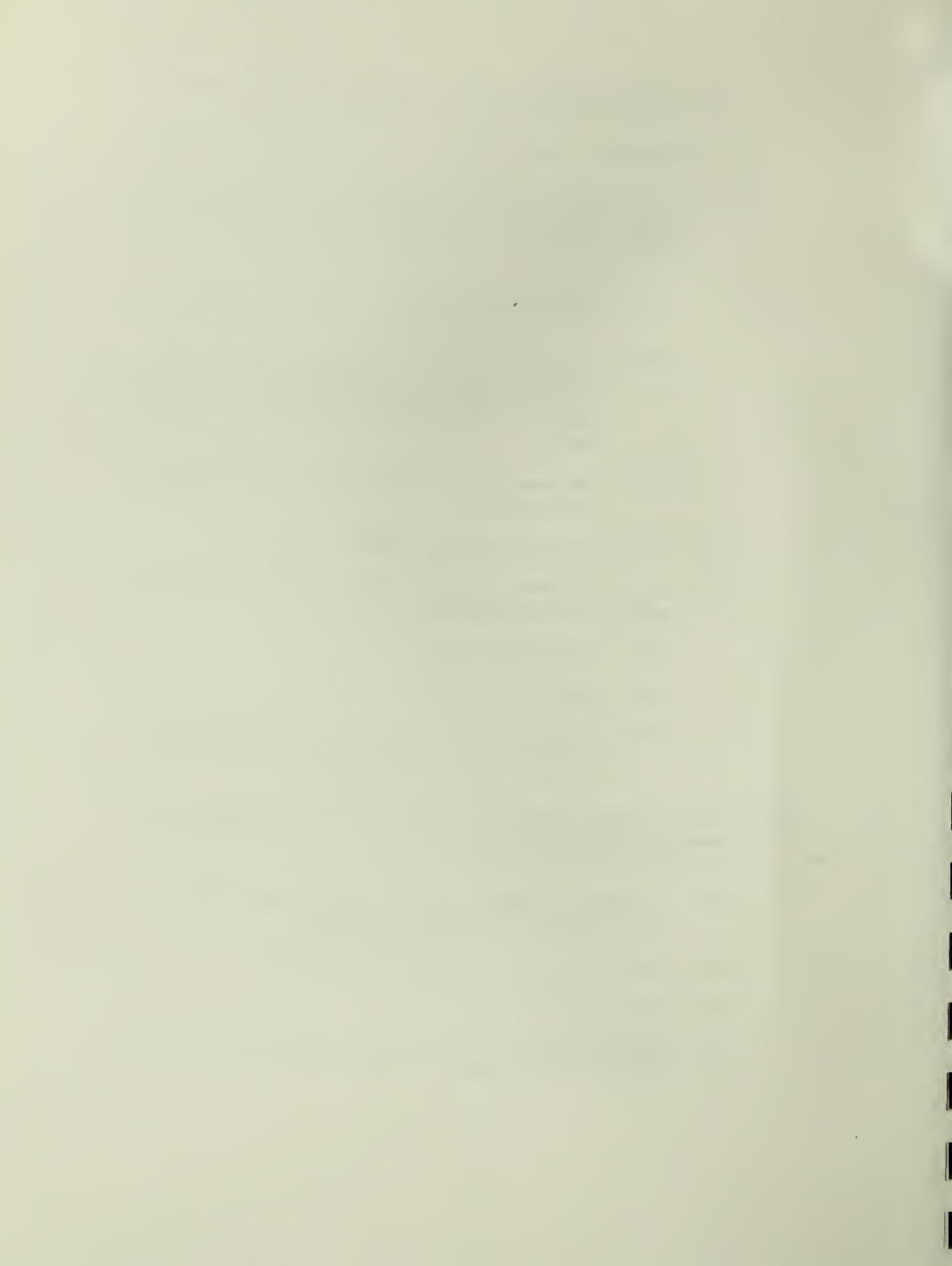
\*If and/or when annual monitoring in Zones 2 and 3 determines over a three year period that the population goal of 1 wolf per 10 square miles is unrealistic or unwise -- in that such population might over-utilize prey species, thus jeopardizing the future wolf population itself -- revision of the population goals will be in order and expected. Such revision(s) would be obtained by working with best available scientific information and the resultant goal figure would be approved by the Eastern Timber Wolf Recovery Team. This situation might require the reduction of the wolf population down to the revised goal population.



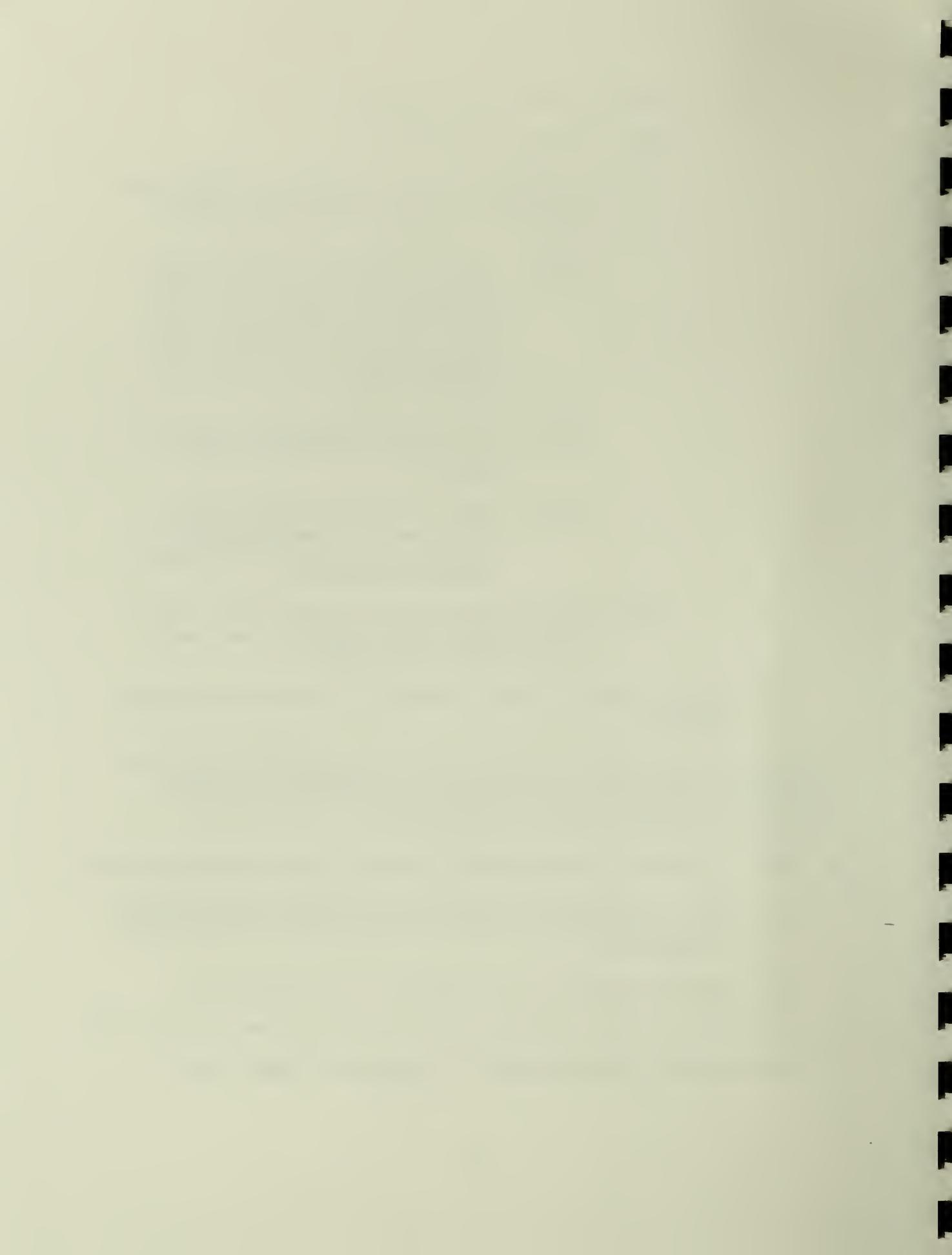
- 122-222-3 Create and maintain well dispersed permanent openings
- 122-223 Promote on the Superior National Forest increased forest/wildlife coordination using the Wildlife Composition Guides to provide increased habitat inventory analysis and habitat manipulation
- 122-224 Encourage other public forest management agencies to develop forest/wildlife coordination programs
- 122-225 Determine the degree to which lower than optimum prey populations are the result of habitat deficiencies and/or over hunting
- 122-23 Provide for the taking by authorized government (State or Federal) employees of individual wolves killing domestic animals
- 122-3 Attempt to re-establish woodland caribou in suitable range, if feasible
- 122-31 Consult with Canadian caribou biologist to determine ecological feasibility of a caribou transplant and to select proper release sites and season
- 122-32 Arrange with Canada to provide caribou
- 122-33 Radio-tag, release and monitor caribou



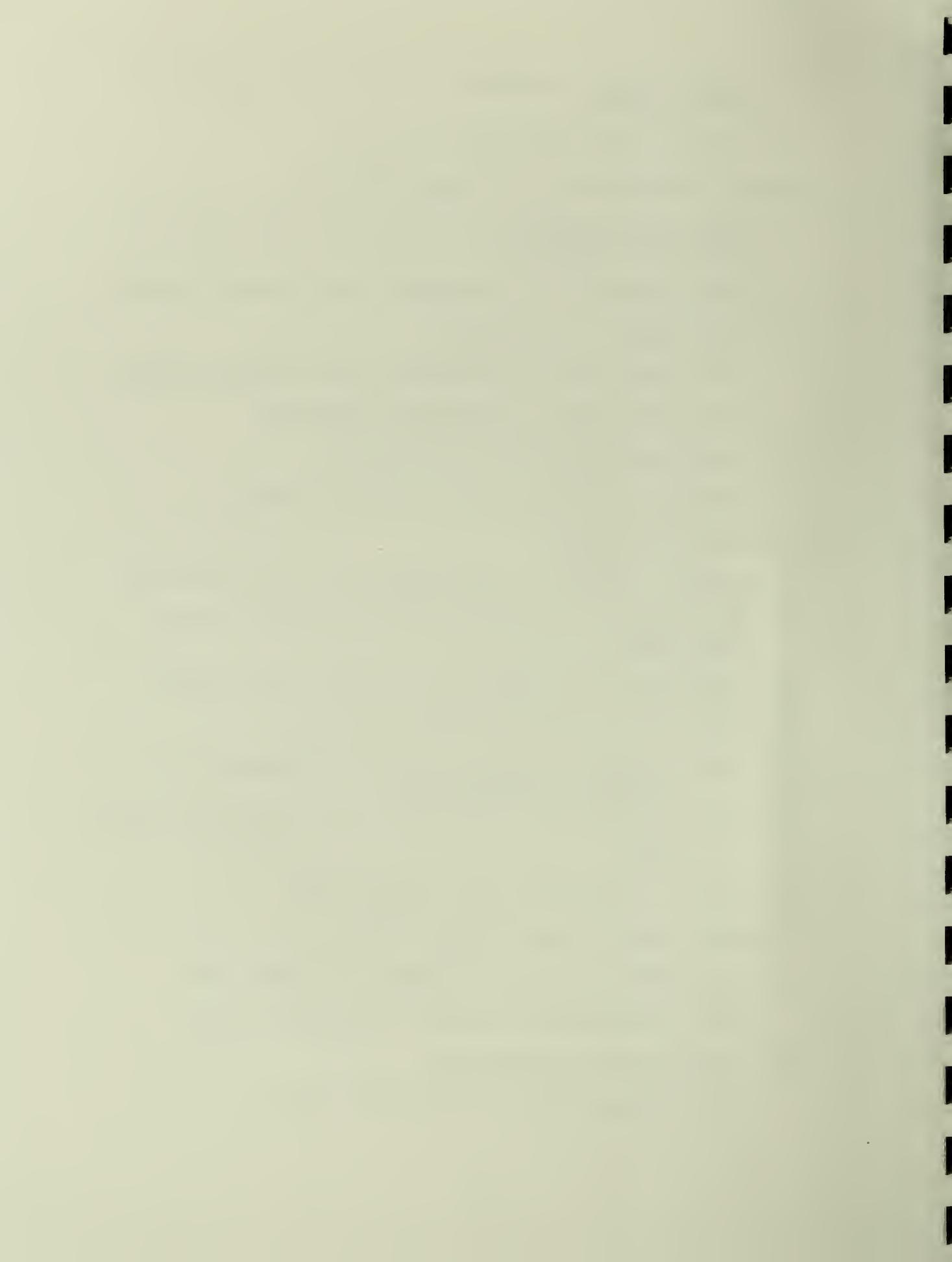
- 122-4 Conduct research on the ecology, behavior and habitat requirements of deer, moose and beaver
- 122-5 Establish total legal protection in Zones 1, 2 and 3
- 122-6 Discourage, in the sanctuaries, development, settlement and the destruction, disturbance or modification of habitat that might reduce wolf populations or restrict their recovery
  - 122-61 Encourage appropriate land use regulations in Zones 1, 2 and 3
  - 122-62 Federal agencies will prepare environmental assessments and/or environmental impact statements to evaluate project impacts on the wolf and initiate Section 7 consultation on public lands
  - 122-63 Encourage habitat management compatible with wolf ecology
- 122-7 Provide concerted law enforcement effort
- 122-8 Regulate harvest of prey species to insure sufficient surplus for wolf population needs
  - 122-81 Monitor wolf population
  - 122-82 Monitor prey populations
  - 122-83 Reduce harvest of deer, moose, and/or beaver if harvesting is demonstrated to be a cause of less than optimum numbers
- 123 Maintain current optimum wolf population averaging 1 per 50 square miles within the forested region Zone 4 outside the sanctuaries (see Appendix A)
  - 123-1 Increase prey populations by habitat improvement or other appropriate management practices
  - 123-2 Provide concerted law enforcement effort
  - 123-3 Same as 122-23
  - 123-4 Regulate harvest of prey species and wolves to maintain above population goals



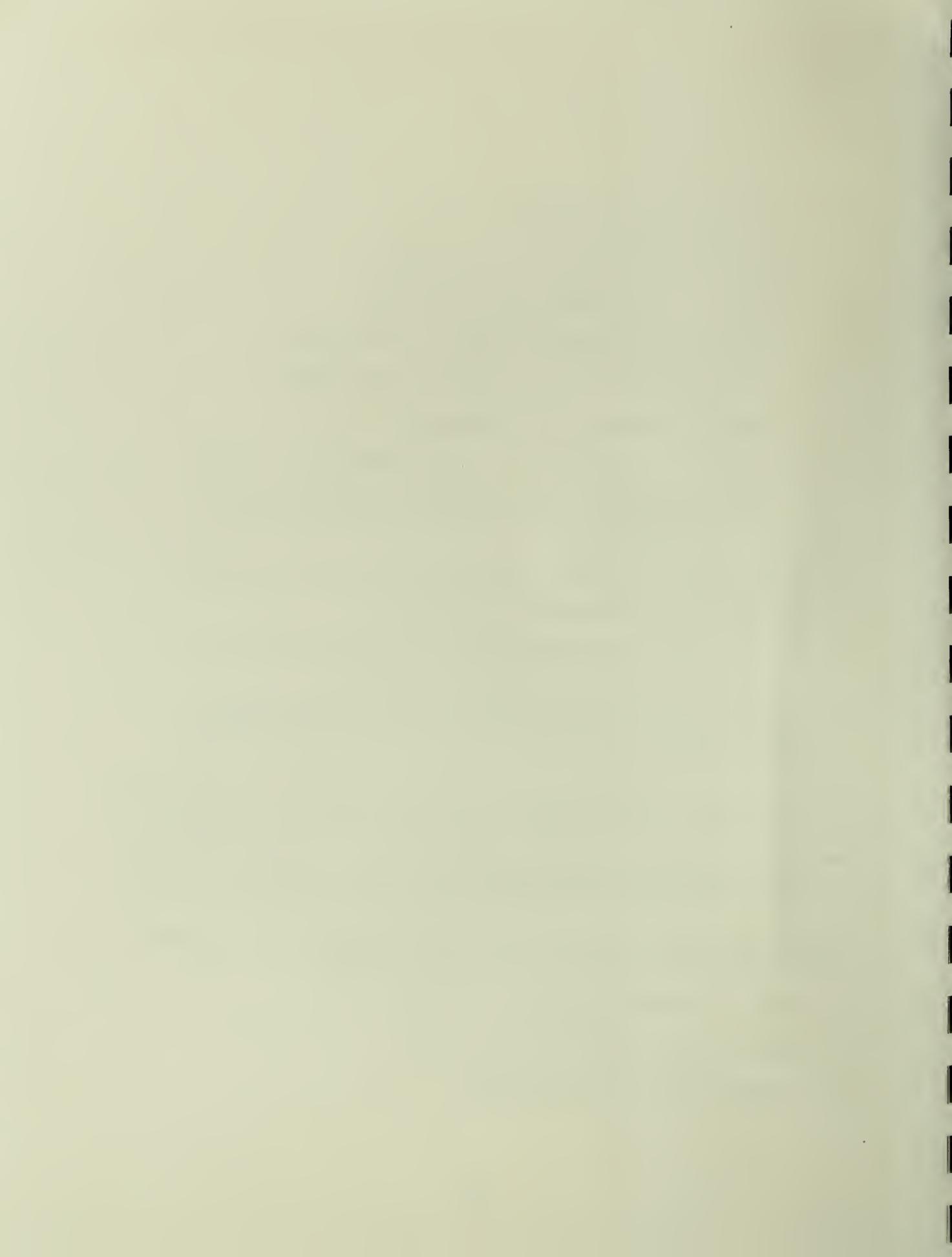
- 123-41 Monitor wolf population
    - 123-42 Monitor prey populations
    - 123-43 Remove annually by hunting and trapping wolves in excess of the goal population. Removal restricted to November through January
      - 123-431 Allow the taking of 1 wolf per 200 square miles during the first year of management (100 wolves). This assumes an additional annual take of 60 wolves under a damage control program and an illegal take of 60 wolves in Zone 4
      - 123-432 Adjust in subsequent years the take up or down to maintain the goal density
      - 123-433 Require registration and tagging of all wolves taken and surrender of carcasses for research to designated government agencies
    - 123-44 Reduce harvest of deer, moose, and/or beaver if harvesting is demonstrated to be a cause of less than optimum numbers
  - 124 Restrict taking of wolves in Zone 5 to authorized government employees
- 2 Protect and enhance existing wolf numbers and re-establish populations if necessary and feasible at optimum levels in Michigan (excluding Isle Royale), Wisconsin and/or Northeastern United States and/or Southern Appalachians Region (see Appendix B)
- 21 Determine whether re-establishment is socially and ecologically sound
- 211 Consult vegetation and ownership maps, land use maps and plans, and local biologists to define and select all suitable areas for transplant
  - 212 Determine potential prey densities in the selected areas
  - 213 Determine human densities and use patterns in the selected areas
  - 214 Determine possible impact of transplant on public health



- 215 Estimate effect of establishing wolves on other wildlife and domestic animals
- 216 Determine legal implications of transplant
- 22 Determine the feasibility of re-establishing E.T.W.
  - 221 Select most inaccessible area with adequate food supply and minimum human population
  - 222 Obtain cooperation from appropriate State and Federal agencies
  - 223 Obtain support of local people
    - 223-1 Contact selected individuals and key groups for support
    - 223-2 Publish facts of situation in news media
  - 224 Obtain approval of key state legislators
  - 225 Stocking and monitoring (see 23 and 24 for details)
- 23 Stock wolves in new areas
  - 231 Hold public meetings and seek support (see 222, 223 and 224)
  - 232 Decide whether to reintroduce the Eastern Timber Wolf and select area(s)
  - 233 Obtain permits from appropriate State and Federal agencies
  - 234 Obtain wolves from nearest viable population
    - 234-1 Arrange for appropriate agency in Minnesota, Ontario, or Quebec to provide wolves
    - 234-2 Prescribe manner and season of live trapping and handling wolves
    - 234-3 Provide holding pens in capture area
    - 234-4 Contact trapper to supply wolves
    - 234-5 Examine, ear-tag, radio-tag and vaccinate wolves
    - 234-6 Accumulate wolves until 5 or more are obtained
  - 235 Deliver wolves to release point
    - 235-1 Arrange shortest and most direct flight



- 235-2 Tranquillize wolves
- 236 Effect non-traumatic release of wolves
  - 236-1 Select appropriate release sites
  - 236-2 Build appropriate pens in release sites
  - 236-3 Hold wolves on release site for 2 weeks
  - 236-4 Feed wolves local wild prey
  - 236-5 Allow wolves to leave pens at will after 2 weeks
  - 236-6 Consider providing carcasses of wild prey near release site
- 24 Monitor restocking efforts and population levels in new areas
  - 241 Train local biologists to radio track
  - 242 Radio track transplanted wolves daily for first week and at intervals of 1 to 2 weeks thereafter
- 25 In Upper Michigan and Northern Wisconsin immediately remove coyote bounties year round and protect wild canids during any big game seasons
- 26 Develop and implement plans for habitat improvement and maintenance for appropriate prey species to maintain viable wolf populations
- 27 Develop management principles and practices to be applied to wolf populations when re-established (These should be agreed upon and announced before transplants take place)
- 3 Continue management to perpetuate natural conditions for the Eastern Timber Wolf on Isle Royale National Park, Michigan
  - 31 Continue to provide complete protection
  - 32 Permit natural fires to run their course
  - 33 Continue research on wolf ecology

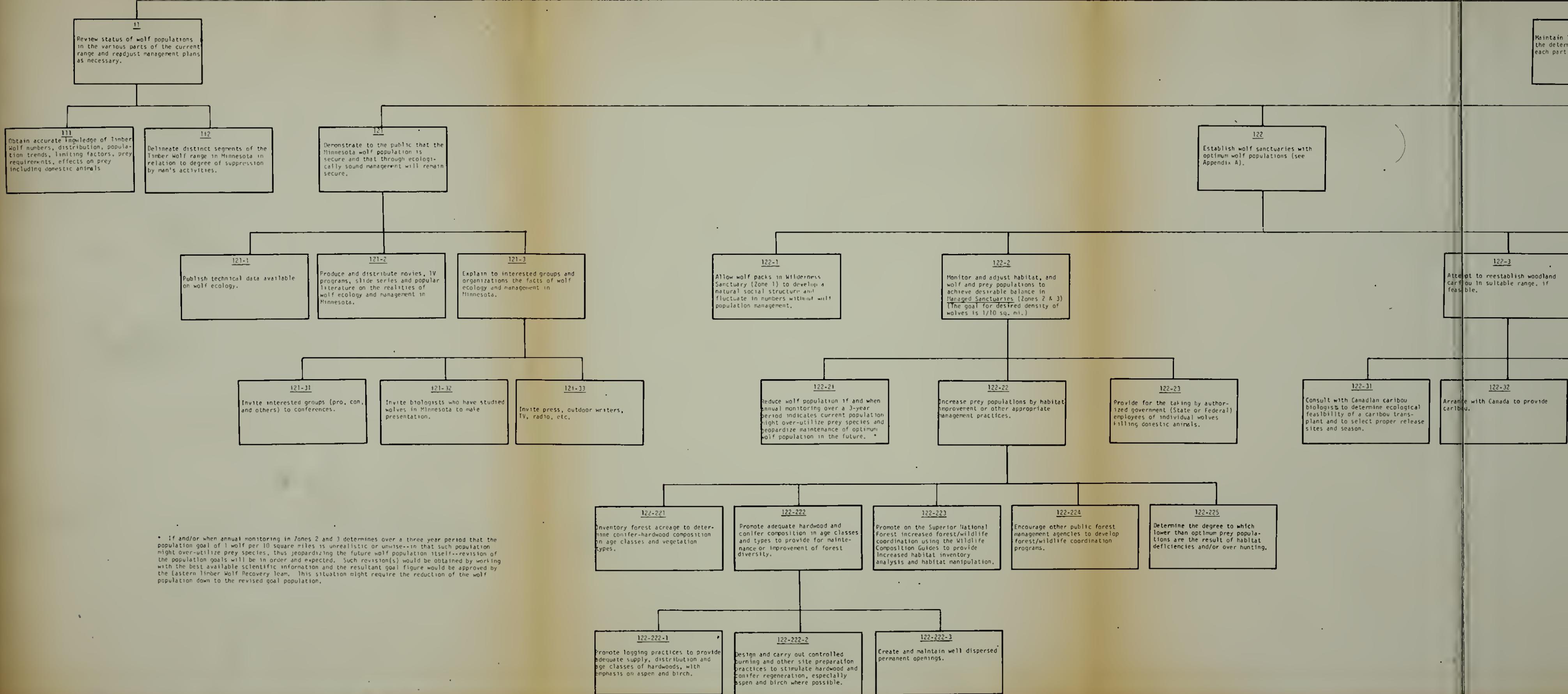


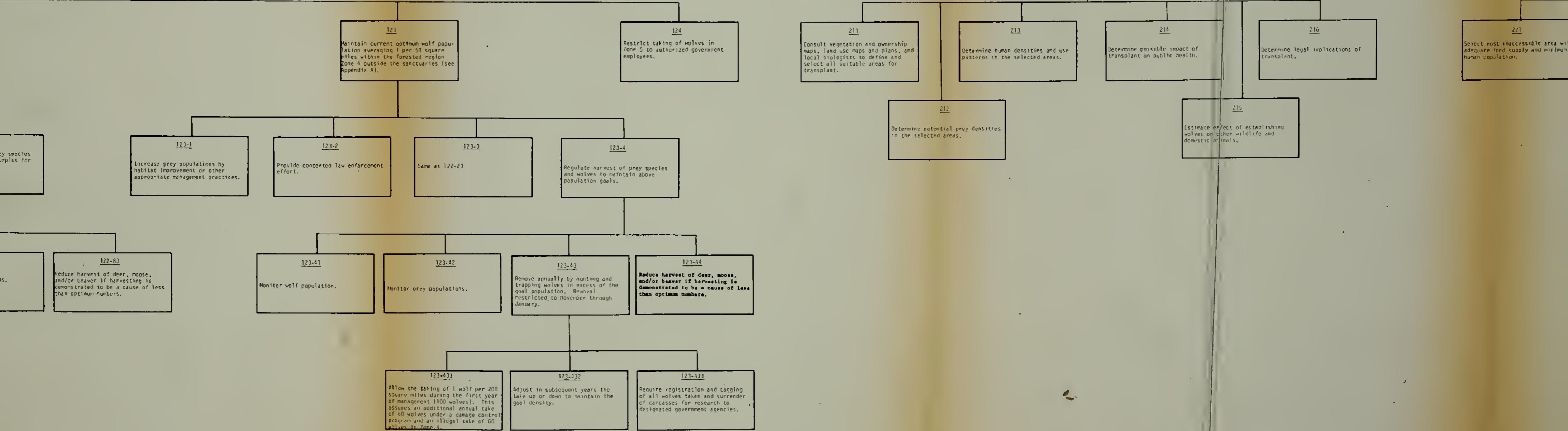
RECOVERY PLAN DIAGRAM

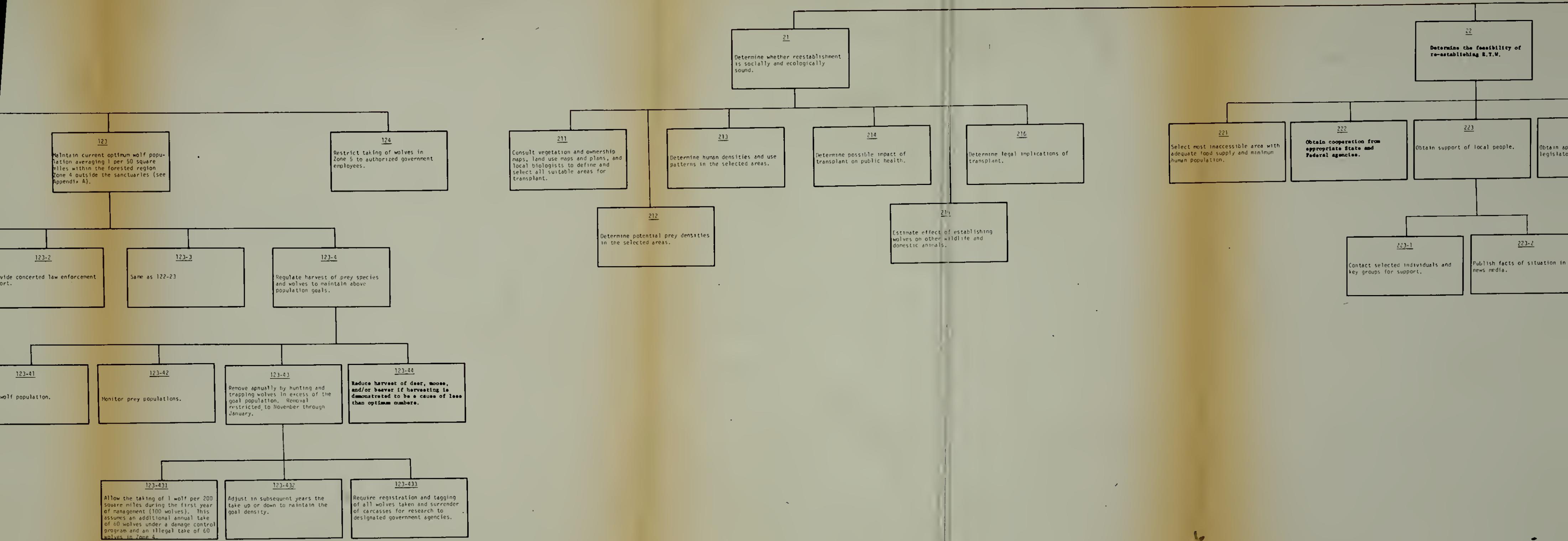


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INSURE PERPETUATION OF THE TIMBER WOLF POPULATION AT LEVELS OPTIMUM TO THE VARYING PARTS OF ITS PRESENT MINNESOTA RANGE (OPTIMUM LEVEL INCLUDES BIOLOGICAL CARRYING CAPACITY AND COMPATIBILITY WITH MAN).







2  
PROTECT AND ENHANCE EXISTING WOLF  
NUMBERS AND REESTABLISH POPULATIONS  
IF NECESSARY AND FEASIBLE AT  
OPTIMUM LEVELS IN MICHIGAN (EXCLUDING  
ISLE ROYAL), WISCONSIN AND/OR  
NORTHEASTERN UNITED STATES AND/OR  
SOUTHERN APPALACHIAN REGION (SEE  
APPENDIX B).

21  
Determine the feasibility of  
re-establishing E.T.W.

23

Stock wolves in new areas.

22  
Obtain support of local people.

224  
Obtain approval of key state  
legislators.

225  
Stocking and monitoring (see 23  
and 24 for details)

231  
Hold public hearings and seek  
support (see 222, 223, and 224).

232  
Decide whether to reintroduce the  
Eastern Timber Wolf and select  
area(s).

233  
Obtain permits from  
appropriate State and  
Federal agencies.

234  
Obtain wolves from nearest viable  
population.

235  
Deliver wolves to release point.

223-1

223-2  
Publish facts of situation in  
news media.

234-1  
Arrange for appropriate agency in  
Minnesota, Ontario, or Quebec to  
provide wolves.

234-2  
Prescribe manner and season of  
live trapping and handling wolves.

234-3  
Provide holding pens in capture  
area.

234-4  
Contact trapper to supply wolves.

234-5  
Examine, ear-tag, radio-tag, and  
vaccinate wolves.

234-6  
Accumulate wolves until 5 or more  
are obtained.

235-1  
Arrange shortest and most direct  
flight.

235-2  
Tranquillize wolves.

236-1  
Select appropriate r

3  
CONTINUE MANAGEMENT TO PERPETUATE  
NATURAL CONDITIONS FOR THE EASTERN  
TIMBER WOLF ON ISLE ROYALE NATIONAL  
PARK, MICHIGAN.

24  
Monitor restocking efforts and  
population levels in new areas.

25  
In Upper Michigan and Northern  
Wisconsin immediately remove coyote  
bounties year round and protect  
wild canids during any big game  
seasons.

26  
Develop and implement plans for  
habitat improvement and mainte-  
nance for appropriate prey species  
to maintain viable wolf populations.

27  
Develop management principles and  
practices to be applied to wolf  
populations when re-established  
(These should be agreed upon and  
announced before transplants take  
place).

31  
Continue to provide complete  
protection.

32  
Permit natural fires to run  
their course.

33  
Continue research on wolf ec-

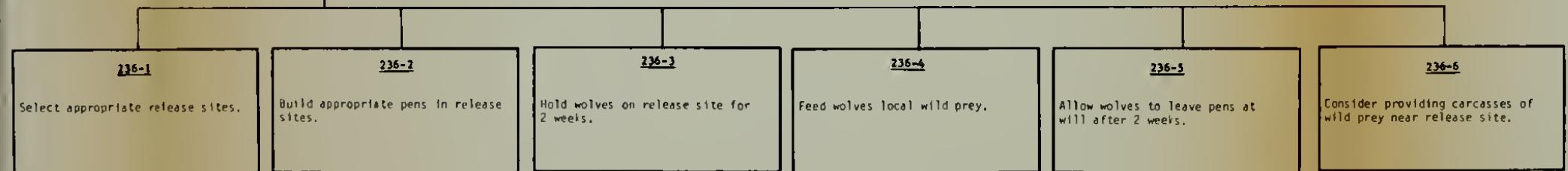
236  
Effect non-traumatic release of  
wolves.

241  
Train local biologists to radio  
track.

242  
Radio track transplanted wolves  
daily for first week and at  
intervals of 1 to 2 weeks there-  
after.

## RECOVERY PLAN

### EASTERN TIMBER WOLF



SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS



GROUP & PRIORITY*	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY** COOPERATORS	TARGET DATE	ESTIMATED COSTS***	
						FY77	FY78
A. RESEARCH AND SURVEY	1 Obtain accurate knowledge of timber wolf numbers, distribution, population trends, limiting factors, prey requirements, effects on prey including domestic animals.	111	FWS	DNR FS NPS	Ongoing	190	215
	2 Delineate distinct segments of the timber wolf range in Minnesota in relation to degree of suppression by man's activities.	112	FWS	DNR FS	Ongoing	1.5	1.5
	3 Review status of wolf populations in the various parts of the current range, and adjust management plan as necessary.	11	FWS	DNR FS	Ongoing	1.5	3.0
	4 Determine the degree to which lower than optimum prey populations are the result of habitat deficiencies and/or over hunting.	122-225	DNR	FWS NC FS	Ongoing	1.5	1.5
	5 Inventory forest acreage to determine conifer-hardwood composition in age classes and vegetation types.	122-221	FS DNR	NPS BLM BIA	Ongoing	100	110
	6 Conduct research on the ecology, behavior and habitat requirements of deer, moose and beavers.	122-4	NC	FWS, DNR NPS, FS	1980	150	170
	7 Consult with Canadian caribou biologists to determine ecological feasibility of a caribou transplant and to select proper release sites and season.	122-31	DNR	FWS NPS NC	1977	2.0	-0-
	8 Monitor wolf population.	122-81 ε 123-41	FWS	DNR, NC FS, NPS	Ongoing	10	10
	9 Monitor prey populations.	122-82 ε 123-42	DNR	FWS, NC FS, NPS	Ongoing	50	50
B. EDUCATIONAL-ADMINISTRATIVE-POLITICAL ACTIONS							
	1 Publish technical data available on wolf ecology.	121-1	FWS	FS, FWS, UM	Ongoing	2.0	2.0
	2 Produce and distribute movies, TV programs, slide series and popular literature on the realities of wolf ecology and management in Minnesota.	121-2	FWS	FS, DNR NPS, PCG	1979	100	10

\* Priority is given for projects within groups, but it is recognized that more than one group may be in progress at any one time, and that circumstances could dictate the undertaking of projects out of sequence.

\*\* Abbreviations for agencies involved: BIA=US Bureau of Indian Affairs; BLM=US Bureau of Land Management; DNR=Minnesota Department of Natural Resources; FS=US Forest Service; ITTC=Indian Tribal Council; NC=North Central Forest Experiment Station of FS; NPS=US National Park Service; PCG=Private conservation groups; S=Applicable State agency; UM=University of Minnesota.

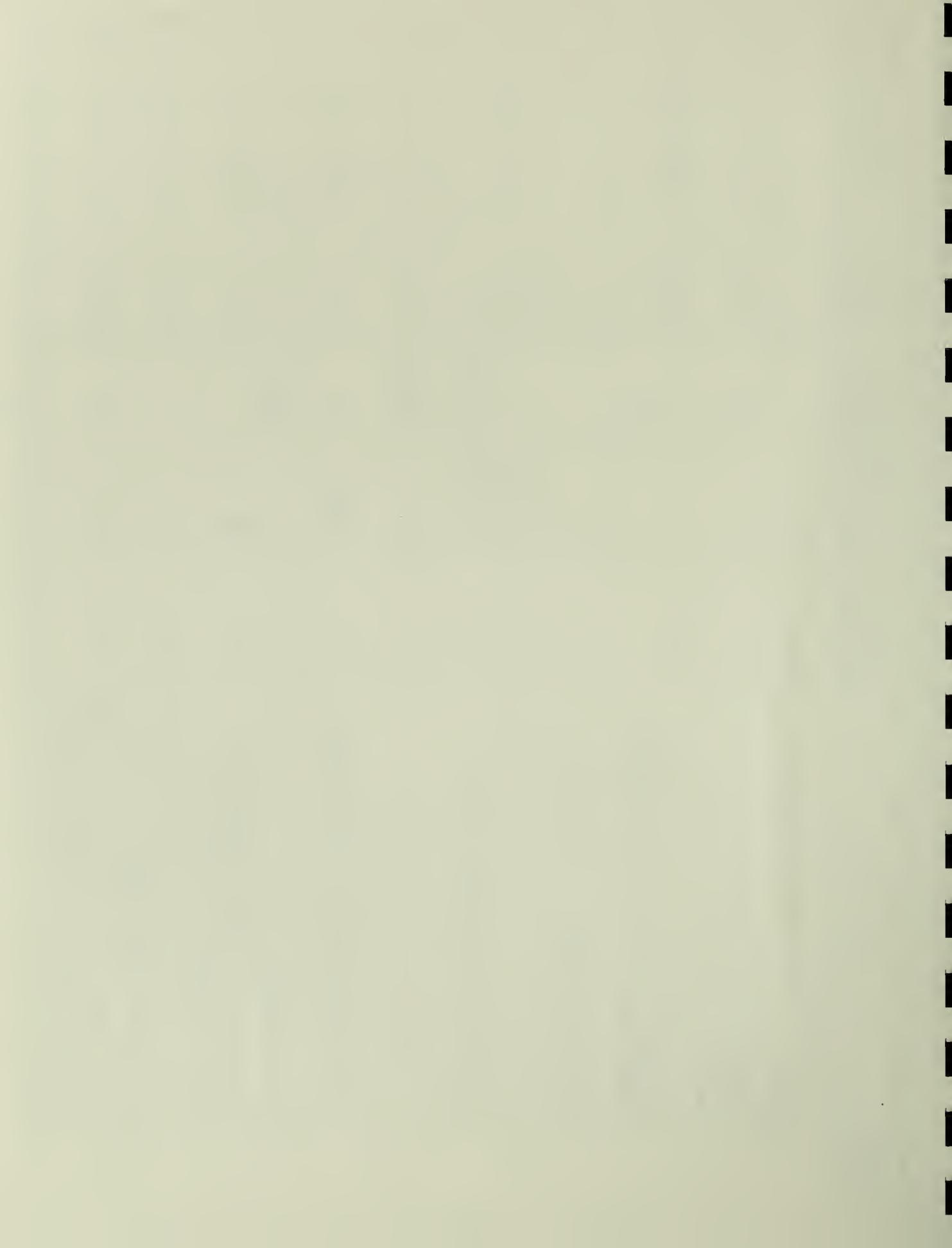
\*\*\* Listed funds are given in thousands of dollars.



GROUP & PRIORITY	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY COOPERATORS	TARGET DATE	FY77	ESTIMATED COSTS FY78	FY79
B. EDUCATIONAL-ADMINISTRATIVE-POLITICAL ACTIONS (continued)								
3	Explain to interested groups and organizations the facts of wolf ecology and management in Minnesota.	121-3	FWS	FS, DNR	1977	709	-0-	-0-
4	Establish wolf sanctuaries with optimum wolf populations (see Appendix A)	122	FWS	DNR FS	1977	-0-	-0-	-0-
CH, HABITAT DEVELOPMENT ACTIONS								
1	Monitor and adjust habitat, and wolf and prey populations to achieve desirable balance in Managed Sanctuaries (Zones 2 and 3). (The goal for desired density of wolves is 1/10 sq.mi.)	122-2	DNR	FS FSW NC	Ongoing	(included in CH. 2, 3 & 4)		
2	Promote logging practices to provide adequate supply, distribution and age classes of hardwoods with emphasis on aspen and birch (cost includes logging road construction).	122-222-1	FS DNR		Ongoing	500	600	700
3	Design and carry out controlled burning and other site preparation practices to stimulate hardwood and conifer regeneration, especially aspen and birch where possible.	122-222-2	FS DNR	BLM	Ongoing	200	210	220
4	Create and maintain well-dispersed permanent openings.	122-222-3	DNR FS	BLM, ITC FWS	Ongoing	100	150	175
5	Promote on the Superior National Forest increased forest/wildlife coordination using the Wildlife Composition Guides to provide increased habitat inventory analysis and habitat manipulation.	122-223	FS	DNR FWS NC	Ongoing	(included in CH. 2, 3 & 4)		
6	Encourage other public forest management agencies to develop forest/wildlife coordination programs.	122-224	DNR	FWS NC	Ongoing	(included in CH. 2, 3 & 4)		
7	Arrange with Canada to provide caribou.	122-32	DNR	NPS, FS, FWS NPS	1977	10	10	10
8	Radio-tag, release and monitor caribou.	122-33	DNR	NC, FWS, FS NPS	1978	-0-	25	25
9	Encourage habitat management compatible with wolf ecology within Zones 1, 2 and 3.	122-63	FS DNR	NPS, NC	Ongoing	(included in CH. 2, 3 & 4)		
CP, PREY REGULATION								
1	Reduce harvest of deer, moose and/or beavers if harvesting is demonstrated to be a cause of less than optimum numbers.	122-83	DNR		Ongoing	-0-	-0-	-0-



GROUP & PRIORITY	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY COOPERATORS	TARGET DATE	ESTIMATED COSTS	
						FY 77	FY 78
CW, WOLF MANAGEMENT ACTIONS							
1	Establish total legal protection in Zones 1, 2 and 3.	122-5	DNR		1977	-0-	-0-
2	Allow wolf packs in Wilderness Sanctuary (Zone 1) to develop a natural social structure and fluctuate in numbers without wolf population management.	122-1	DNR	FS NC	Ongoing	-0-	-0-
3	Monitor and adjust habitat, and wolf and prey populations to achieve desirable balance in Managed Sanctuaries (Zones 2 and 3). (The goal for desired density of wolves is 1/10 sq. mi.) (Same as CH.1)	122-2	DNR	FS FWS NC	Ongoing	(included in CH. 2,3 & 4)	
4	Provide for the taking by authorized Government (State or Federal) employees of individual wolves killing domestic animals.	122-23	DNR FWS		Ongoing	40	45
5	Encourage appropriate land use regulations in Zones 1, 2 and 3.	122-61	Minnesota Legislature	FS	Ongoing	-0-	-0-
6	Federal Agencies will prepare EA's and/or EIS's to evaluate project impacts & initiate Section 7 consultation.	122-62	All appropriate Federal, State and local agencies		Ongoing	UNK	UNK
7	Provide concerted law enforcement effort.	122-7	DNR	FWS FS NPS, BLM	Ongoing	300	275
D. MAINTENANCE OF WOLF POPULATION AND WOLF HABITAT							
1	Within forested region of Zone 4, increase prey populations by habitat improvement or other appropriate management practices.	123-1	Counties DNR, FS	BIM	Ongoing	(included in CH. 1)	
2	Within forested region of Zone 4, provide concerted law enforcement effort.	123-2	DNR	FWS FS NPS, BLM	Ongoing	(included in CW. 5)	
3	Within forested region of Zone 4, provide for the taking by authorized Government (State or Federal) employees of individual wolves killing domestic animals (same as CW.2).	123-3	DNR FWS		Ongoing	(included in CW. 2)	
4	Within forested region of Zone 4, regulate harvest of prey species and wolves to maintain population goals (see 123)(1 wolf/50 square miles).	123-4	DNR		Ongoing	-0-	-0-
5	Allow the taking of 1 wolf per 200 square miles during the first year of management (100 wolves). This assumes an additional annual take of 60 wolves under a damage control program and an illegal take of 60 wolves in Zone 4.	123-431	DNR	FWS	Ongoing	5.0	5.0



GROUP & PRIORITY	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY COOPERATORS	TARGET DATE	ESTIMATED COSTS	
						FY77	FY78
<b>D. MAINTENANCE OF WOLF POPULATION AND WOLF HABITAT (continued)</b>							
6	Adjust in subsequent years the take up or down to maintain the goal density.	123-432	DNR	FWS	Ongoing	(included in D. 5)	
7	Require registration and tagging of all wolves taken and surrender of carcasses for research, to designated Government agencies.	123-433	DNR	FWS	Ongoing	(included in D. 5)	
8	Restrict taking of wolves in Zone 5 (see map) to authorized Government employees.	124	DNR FWS		Ongoing	(included in CW. 2)	



## SECTION 2. REESTABLISHMENT OF EASTERN TIMBER WOLF POPULATIONS IN PORTIONS OF ITS FORMER RANGE

GROUP & PRIORITY	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY COOPERATORS	TARGET DATE	ESTIMATED COSTS FY78	FY79
A. RESEARCH AND SURVEY							
1	Consult vegetation and ownership maps, land use maps and plans, and local biologists to define and select all suitable areas for transplant.	211	FWS	St	1978	-0-	50
2	Determine potential prey densities in the selected areas.	212	St	FS, NPS, FWS	1978	(included in A. 1)	
3	Determine human densities and use patterns in the selected areas.	213	St	FS, NPS, FWS	1978	(included in A. 1)	
4	Determine possible impact of transplant on public health.	214	FWS, US Public Health Service	St, FS, NPS	1978	(included in A. 1)	
5	Estimate effect of establishing wolves on other wildlife and domestic animals.	215	St	FWS	1978	(included in A. 1)	
6	Determine legal implications of transplant.	216	St, FWS		1978	(included in A. 1)	
7	Determine whether reestablishment is socially and ecologically sound.	21	St, FWS	FS, NPS	1978	(included in A. 1)	
B. EDUCATIONAL-ADMINISTRATIVE-POLITICAL ACTIONS							
1	In Upper Michigan and Northern Wisconsin immediately remove coyote bounties year round and protect wild canids during any big game seasons.	25	State Legislature	St	1977	-0-	-0-
2	Select most inaccessible area with adequate food supply and minimum human population.	221	FWS	FS, St, NPS	1979	-0-	-0-
3	Obtain cooperation from appropriate State and Federal agencies.	222	FWS, St	FS, NPS	1979	(included in B. 1)	
4	Obtain support of local people.	223	St	FS, FWS NPS, PCG	1979	(included in B. 1)	
5	Contact selected individuals and key groups for support.	223-1	St	FS, FWS NPS, PCG	1979	(included in B. 1)	
6	Publish facts of situation in local news media.	223-2	St	FS, FWS NPS, PCG	1979	(included in B. 1)	
7	Obtain approval of key State legislators.	224	St	FS, FWS NPS, PCG	1979	(included in B. 1)	
8	Hold public meetings and seek support (see B.2, B.3, and B.6).	231	St	FS, FWS NPS, PCG	1979	(included in B. 1)	
9	Decide whether to reintroduce Eastern Timber Wolf, and select area(s).	232	FWS, St	FS, NPS	1979	(included in B. 1)	



GROUP & PRIORITY	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY COOPERATORS	TARGET DATE	ESTIMATED COSTS FY77	FY78	FY79
C. NATURAL RESOURCES MANAGEMENT ACTIONS								
1	Arrange for appropriate agency in Minnesota, Ontario or Quebec to provide wolves.	234-1	FWS	St, FS NPS	1978	20	24	28
2	Develop management principles and practices to be applied to wolf populations when reestablished (these should be agreed upon and announced before transplants take place).	27	FWS	St	1978	(included in C. 1)		
3	Select appropriate release sites.	236-1	St, FS, NPS	FWS	1978	(included in C. 1)		
4	Provide holding pens in capture area.	234-3	St		1979	(included in C. 1)		
5	Build appropriate pens in release sites.	236-2	St, FS, NPS	FWS	1979	(included in C. 1)		
6	Prescribe manner and season of live trapping and handling wolves.	234-2	FWS		1978	(included in C. 1)		
7	Contact trapper to supply wolves.	234-4	St, NPS	FS, FWS	1978	(included in C. 1)		
8	Accumulate wolves until 5 or more are obtained.	234-6	St, NPS	FS, FWS	1979	(included in C. 1)		
9	Examine, ear-tag, radio-tag and vaccinate wolves.	234-5	FWS		1979	(included in C. 1)		
10	Arrange shortest and most direct flight.	235-1	FWS		1979	(included in C. 1)		
11	Tranquillize wolves.	235-2	FWS		1979	(included in C. 1)		
12	Deliver wolves to release point.	235	St, NPS, FS	FWS	1979	(included in C. 1)		
13	Hold wolves on release site for 2 weeks, and feed wolves local wild prey.	236-3 236-4	St, NPS, FS	FWS	1979	(included in C. 1)		
14	Effect non-traumatic release of wolves; allow wolves to leave pens at will after 2 weeks; consider providing carcasses of wild prey near release site.	236-5 236-6	St, NPS, FS	FWS	1979	(included in C. 1)		
15	Develop and implement plans for habitat improvement and maintenance for appropriate prey species to maintain viable wolf populations.	26	St, NPS, FS	FWS	1979	(included in C. 1)		



GROUP PRIORITY	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY COOPERATORS	TARGET DATE	ESTIMATED COSTS FY77	FY78	FY79
D. FEEDBACK INVESTIGATIONS								
1	Train local biologists to radio track.	241	FWS	St, FS, NPS	1979	-0-	20	-0-

2 Radio track transplanted wolves daily for first week and at intervals of 1 to 2 weeks thereafter.

## SECTION 3. INSURE PERPETUATION OF EASTERN TIMBER WOLF IN ISLE ROYALE NATIONAL PARK, MICHIGAN

GROUP PRIORITY	NAME OF ACTION	PLAN DESIGNATION	LEAD	RESPONSIBILITY COOPERATORS	TARGET DATE	ESTIMATED COSTS FY77	FY78	FY79
A. RESEARCH AND SURVEY								
1	Continue research on wolf ecology.	33	NPS	FWS	Ongoing	30	30	30
CH. HABITAT DEVELOPMENT ACTIONS								
1	Permit natural fires to run their course.	32	NPS		Ongoing	-0-	-0-	-0-
CW. WOLF MANAGEMENT ACTIONS								
1	Continue to provide complete protection.	31	NPS		Ongoing	-0-	-0-	-0-



EASTERN TIMBER WOLF RECOVERY PLAN  
CHECKLIST OF NECESSARY ACTIONS

	UNDERWAY AS PLANNED	COMPLETED
SECTION 1. MINNESOTA		
A. RESEARCH AND SURVEY		
1. Demography and ecology of wolf	X	
2. Delineate segments of range	X	
3. Status of populations throughout range	X	
4. Determine causes of low prey densities	X	
5. Determine conifer-hardwood composition and vegetation types	X	
6. Ecological requirements of prey species		
7. Feasibility of caribou transplant		
8. Monitor wolf population	X	
9. Monitor prey populations		
B. EDUCATIONAL-ADMINISTRATIVE-POLITICAL ACTIONS		
1. Publish available data	X	
2. Distribute facts in popular media		
3. Explain facts to interested groups		
4. Establish wolf sanctuary in Minnesota		
C. HABITAT DEVELOPMENT ACTIONS		
1. Balance habitat and animal populations in Zones 2 and 3		
2. Promote logging practices: emphasize aspen & birch		
3. Control burn and stimulate regeneration		
4. Create and maintain openings		
5. Increase forest/wildlife coordination: Superior NF		
6. Increase forest/wildlife coordination: other forests		



## CH. HABITAT DEVELOPMENT ACTIONS (continued)

- |   |       |       |
|---|-------|-------|
| 7. Improve forest composition to support prey       | _____ | _____ |
| 8. Maintain and improve conifer cover               | _____ | _____ |
| 9. Arrange with Canada to provide caribou           | _____ | _____ |
| 10. Tag, release and monitor caribou                | _____ | _____ |
| 11. Habitat management compatible with wolf ecology | _____ | _____ |

## CP. PREY REGULATION

- |   |       |       |
|---|-------|-------|
| 1. Regulate deer, moose and beaver harvest if required<br>to maximize their numbers | _____ | _____ |
|---|-------|-------|

## CW. WOLF MANAGEMENT ACTIONS

- |  |       |       |
|--|-------|-------|
| 1. Establish total protection in sanctuary                               | _____ | _____ |
| 2. Allow natural wolf population development in Zone 1                   | _____ | _____ |
| 3. Manage for balanced habitat/prey/wolf populations<br>in Zones 2 and 3 | _____ | _____ |
| 4. Take wolves that kill domestic animals                                | _____ | _____ |
| 5. Encourage development of land use regulations<br>in Zones 1, 2, and 3 | _____ | _____ |
| 6. EA/EIS to evaluate impact on wolf                                     | _____ | _____ |
| 7. Provide concerted law enforcement effort                              | _____ | _____ |

## D. MAINTENANCE OF WOLF POPULATION AND HABITAT

- |   |       |       |
|---|-------|-------|
| 1. Zone 4 forests:increase prey populations by<br>habitat improvement                                   | _____ | _____ |
| 2. Zone 4 forests:provide concerted law enforcement<br>effort   | _____ | _____ |
| 3. Zone 4 forests.take wolves that kill domestic<br>animals   | _____ | _____ |
| 4. Zone 4 forests:regulate harvest of prey and wolves<br>to maintain population goals (1 wolf/50 sq mi) | _____ | _____ |
| 5. Allow taking 1 wolf/200 square miles during 1st year   | _____ | _____ |



D. MAINTENANCE OF WOLF POPULATION AND HABITAT (continued)

- |  |       |       |
|--|-------|-------|
| 6. Adjust taking of wolf to maintain goal density                  | _____ | _____ |
| 7. Register and tag all wolves taken and surrender<br>for research | _____ | _____ |
| 8. Restrict taking of wolves to Government employees<br>in Zone 5  | _____ | _____ |

SECTION 2. FORMER RANGE AREAS

A. RESEARCH AND SURVEY

- |   |       |       |
|---|-------|-------|
| 1. Consult maps, plans and local biologists                           | _____ | _____ |
| 2. Determine potential prey densities                                 | _____ | _____ |
| 3. Determine human densities and use patterns                         | _____ | _____ |
| 4. Determine impact on public health                                  | _____ | _____ |
| 5. Estimate effect on wildlife and domestic animals                   | _____ | _____ |
| 6. Determine legal implications                                       | _____ | _____ |
| 7. Determine if reestablishment is socially and<br>ecologically sound | _____ | _____ |

B. EDUCATIONAL-ADMINISTRATIVE-POLITICAL ACTIONS

- |   |       |       |
|---|-------|-------|
| 1. Remove coyote bounties in Upper Michigan and<br>Northern Wisconsin | _____ | _____ |
| 2. Select most inaccessible area with food and<br>fewest humans       | _____ | _____ |
| 3. Obtain cooperation from State and Federal agencies                 | _____ | _____ |
| 4. Obtain support of local people                                     | _____ | _____ |
| 5. Contact individuals and key groups for support                     | _____ | _____ |
| 6. Publish facts in local news media                                  | _____ | _____ |
| 7. Obtain approval of key State legislatures                          | _____ | _____ |
| 8. Hold public hearings and seek support                              | _____ | _____ |
| 9. Determine if and where to reintroduce wolf                         | _____ | _____ |



#### C. NATURAL RESOURCES MANAGEMENT

1. Arrange for agency to provide wolves \_\_\_\_\_
2. Develop wolf management practices to be employed \_\_\_\_\_
3. Select appropriate release sites \_\_\_\_\_
4. Provide holding pens in capture area \_\_\_\_\_
5. Build pens in release sites \_\_\_\_\_
6. Prescribe live trapping and handling methods \_\_\_\_\_
7. Contact trapper to supply wolves \_\_\_\_\_
8. Accumulate 5 or more wolves \_\_\_\_\_
9. Examine, tag, vaccinate wolves \_\_\_\_\_
10. Arrange shortest and most direct flight \_\_\_\_\_
11. Tranquilize wolves \_\_\_\_\_
12. Deliver wolves to release point \_\_\_\_\_
13. Hold wolves 2 weeks; feed them local wild prey \_\_\_\_\_
14. Effect non-traumatic release of wolves \_\_\_\_\_
15. Improve habitat to maintain prey/wolves \_\_\_\_\_

#### D. FEEDBACK INVESTIGATIONS

1. Train local biologists to radio track \_\_\_\_\_
2. Radio track according to schedule set \_\_\_\_\_
3. Monitor efforts and population levels in new areas \_\_\_\_\_

### SECTION 3. ISLE ROYALE NATIONAL PARK, MICHIGAN

#### A. RESEARCH AND SURVEY

1. Continue research on wolf ecology \_\_\_\_\_ X \_\_\_\_\_

#### B. HABITAT DEVELOPMENT

1. Continue to manage for natural conditions, including \_\_\_\_\_ X \_\_\_\_\_ permitting natural fires

#### C. WOLF MANAGEMENT ACTIONS

1. Continue to provide complete protection \_\_\_\_\_ X \_\_\_\_\_



## PART IV

### ESSENTIAL AREAS

The sanctuary areas Zones 1, 2 and 3 indicated in Appendix A, plus Isle Royale National Park, are considered to be essential areas for the assured survival of the Eastern Timber Wolf. These areas provide the space for normal growth and movement of established pack units and will supply sufficient food and cover for the assured survival of the species.

To describe all of the land within these sanctuary areas as essential habitat would be unrealistic. The wolf is a wide ranging animal and is reasonably adaptable. As long as its food supply is assured and as long as man will let the animal live, it is unreasonable to try to define or describe habitat that is essential to its survival. Of far greater importance is the way land is managed for the wolf's prey.

Obviously, any human activity that restricts or reduces the carrying capacity of prey species will ultimately affect the wolf adversely. The maintenance of the present forest products industry and its expansion, therefore, is encouraged. Activities or programs that provide forest/wildlife management should be encouraged. Activities that permanently remove forest cover are to be discouraged, such as road building, mining, resort development and major reservoir construction. State and Federal agencies should be encouraged to purchase in-holdings in their project areas. Where opportunities exist to expand these areas through purchase, it should be done.

Because of the diverse conditions within each sanctuary, proposed developments would have a varying degree of significance. Each must be appraised in relation to the specific site for which it is proposed.

It is especially important to note that any single development may not in itself significantly degrade an area as wolf habitat, but that each would contribute to the ultimate unsuitability of the area for wolf survival. This cumulative effect must always be considered in appraising the potential harm of any development in the sanctuary area.

All proposed Federal and State actions or programs requiring an Environmental Impact Statement in accordance with Section 202C of the Environmental Policy Act of 1969 (P.L. 91-190) should include an analysis of the impact of the project proposal on the Eastern Timber Wolf. Projects requiring an environmental assessment should include an appraisal of its impact on the Eastern Timber Wolf, and measures to mitigate these impacts.



## APPENDIX A

### DESCRIPTION OF ZONES

#### ZONE 1 - 4,462 Square Miles

Beginning at the point of intersection of United States and Canadian boundaries in Section 22, Township 71 North, Range 22 West, in Rainy Lake, then proceeding along the west side of Sections 22, 27, and 34 in said township to the east side of Black Bay Narrows in Black Bay; thence proceeding along the North and East shoreline of Black Bay to the Black Bay Portage to Kabetogama Lake; thence southeasterly along the Black Bay Portage to Kabetogama Lake; thence southeasterly along the southern shoreline of Kabetogama Lake to Moosehorn Point - the junction of County Route 122 with Kabetogama Lake; thence southerly along County Route 122 to the junction with State Highway 53: thence southeasterly along State Highway 53 to the junction with County Route 765; thence easterly along County Route 765 to the junction with Kabetogama Lake in Ash River Bay; thence along the south boundary of Section 33 in Township 69 North, Range 19 West, to the junction with the Moose River; thence southeasterly along the Moose River to Moose Lake; thence along the western shore of Moose Lake to the river between Moose Lake and Long Lake; thence along the said river to Long Lake; thence along the east shore of Long Lake to the drainage on the southeast side of Long Lake in NE 1/4, Section 18, Township 67 North, Range 18 West; thence along the said drainage southeasterly and subsequently northeasterly to Marion Lake, the drainage being in Section 17 and 18, Township 67 North, Range 18 West; thence along the west shoreline of Marion Lake proceeding southeasterly to the Moose Creek; thence along Moose Creek to Flap Creek; thence southeasterly along Flap Creek to the Vermilion River; thence southerly along the Vermilion River to Vermilion Lake; thence along the Superior National Forest boundary in a southeasterly direction through Vermilion Lake passing these points: Oak Narrows, Muskrat Channel, South of Pine Island, to Hoodo Point and the junction with County Route 697; thence southeasterly on County Route 697 to the junction with State Highway 169; thence easterly along State Highway 169 to the junction with State Highway 1; thence easterly along State Highway 1 to the junction with the Erie Railroad tracks at Murphy City; thence easterly along the Erie Railroad tracks to the junction with Lake Superior at Taconite Harbor; thence northeasterly along the North Shore of Lake Superior to the Canadian Border; thence westerly along the Canadian border to the point of beginning in Rainy Lake.

#### ZONE 2 - 1,864 Square Miles

Beginning at the intersection of the Erie Mining Company Railroad and State Highway 1 (Murphy City); thence southeasterly on State Highway 1 to the junction with County Road 4; thence southwesterly on County Road 4 to the State Snowmobile Trail (formerly the Alger-Smith Railroad); thence southwesterly along the Snowmobile Trail to the junction with Reserve Mining Company Railroad; thence northwesterly along the Railroad to Forest Road 107; thence westerly along Forest Road 107 to Forest Road 203; thence westerly along Forest Road 203 to the junction with County Route 2; thence in a northerly direction on County Route 2 to the



junction with Forest Road 122; thence in a westerly direction along Forest Road 122 to the junction with the Duluth, Missable and Iron Range Railroad; thence in a southwesterly direction along the said railroad tracks to the junction with County Route 14; thence in a northwesterly direction along County Route 14 to the junction with County Route 55; thence in a westerly direction along County Route 55 to the junction with County Route 44; thence in a southerly direction along County Route 44 to the junction with County Route 266; thence in a southeasterly direction along County Route 266 and subsequently in a westerly direction to the junction with County Road 44; thence in a northerly direction on County Road 44 to the junction with Township Road 2815; thence westerly along Township Road 2815 to Alden Lake; thence northwesterly across Alden Lake to the inlet of the Cloquet River; thence northerly along the Cloquet River to the junction with Carroll Trail - State Forestry Road; thence west along the Carroll Trail to the junction with County Route 4 and County Route 49; thence west along County Route 49 to the junction with the Duluth, Winnipeg and Pacific Railroad; thence in a northerly direction along said Railroad to the junction with the Whiteface River; thence in a northeasterly direction along the Whiteface River to the Whiteface Reservoir; thence along the western shore of the Whiteface Reservoir to the junction with County Route 340; thence north along County Route 340 to the junction with County Route 16; thence east along County Route 16 to the junction with County Route 346; thence in a northerly direction along County Route 346 to the junction with County Route 569; thence along County Route 569 to the junction with County Route 565; thence in a westerly direction along County Route 565 to the junction with County Route 110; thence in a westerly direction along County Route 110 to the junction with County Road 100; thence in a north and subsequent west direction along County Route 100 to the junction with State Highway 135; thence in a northerly direction along State Highway 135 to the junction with State Highway 169 at Tower; thence in an easterly direction along the southern boundary of Zone 1 to the point of beginning of Zone 2 at the junction of the Erie Railroad Tracks and State Highway 1.

#### ZONE 3 - 3,501 Square Miles

Beginning at the junction of State Highway 11 and State Highway 65; thence southeasterly along State Highway 65 to the junction with State Highway 1; thence westerly along State Highway 1 to the junction with State Highway 72; thence north along State Highway 72 to the junction with an un-numbered township road beginning in the northeast corner of Section 25, Township 155 North, Range 31 West; thence westerly along the said road for approximately seven (7) miles to the junction with SFR 95: thence westerly along SFR 95 and continuing west through the southern boundary of Sections 36 through 31, Township 155 North, Range 33 West, through Sections 36 through 31, Township 155 North, Range 34 West, through Sections 36 through 31, Township 155 North, Range 35 West, through Sections 36 and 35, Township 155 North, Range 36 West to the junction with State Highway 89; thence northwesterly along State Highway 89 to the junction with County Route 44; thence northerly along County Route 44 to the junction with County Route 704; thence northerly along County 704 to the junction with SFR 49; thence northerly along SFR 49 to the junction



with SFR 57; thence easterly along SFR 57 to the junction with SFR 63: thence south along SFR 63 to the junction with SFR 70; thence easterly along SFR 70 to the junction with County Route 87; thence easterly along County Route 87 to the junction with County Route 1; thence south along County Route 1 to the junction with County Route 16; thence easterly along County Route 16 to the junction with State Highway 72; thence south on State Highway 72 to the junction with a gravel road (un-numbered County District Road) on the north side of Section 31, Township 158 North, Range 30 West; thence east on said District Road to the junction with SFR 62; thence easterly on SFR 62 to the junction with SFR 175; thence south on SFR 175 to the junction with County Route 101; thence easterly on County Route 101 to the junction with County Route 11; thence easterly on County Route 11 to the junction with State Highway 11; thence easterly on State Highway 11 to the junction with State Highway 65, the point of beginning.

ZONE 4 - 20,901 Square Miles

Excluding Zones 1, 2 and 3, all that part of Minnesota north and east of a line beginning on State Trunk Highway 48 at the eastern boundary of the state; thence westerly along Highway 48 to Interstate Highway 35; thence northerly on I-35 to State Highway 23, thence west one-half mile on Highway 23 to State Trunk Highway 18; thence westerly along Highway 18 to State Trunk Highway 65, thence northerly on Highway 65 to State Trunk Highway 210; thence westerly along Highway 210 to State Trunk Highway 6; thence northerly on State Trunk Highway 6 to Emily; thence westerly along County State Aid Highway (CSAH) 1, Crow Wing County, to CSAH 2, Cass County; thence westerly along CSAH 2 to Pine River; thence northwesterly along State Trunk Highway 371 to Backus; thence westerly along State Trunk Highway 87 to U.S. Highway 71; thence northerly along U.S. 71 to State Trunk Highway 200; thence northwesterly along Highway 200 to County State Aid Highway (CSAH) 2, Clearwater County; thence northerly along CSAH 2 to Shevlin; thence along U.S. Highway 2 to Bagley; thence northerly along State Trunk Highway 92 to Gully; thence northerly along CSAH 2, Polk County, to CSAH 27, Pennington County; thence along CSAH 27 to State Trunk Highway 1; thence easterly on Highway 1 to CSAH 28, Pennington County; thence northerly along CSAH 28 to CSAH 54, Marshall County; thence northerly along CSAH 54 to Grygla; thence west and northerly along Highway 89 to Roseau; thence northerly along State Trunk Highway 310 to the Canadian border.

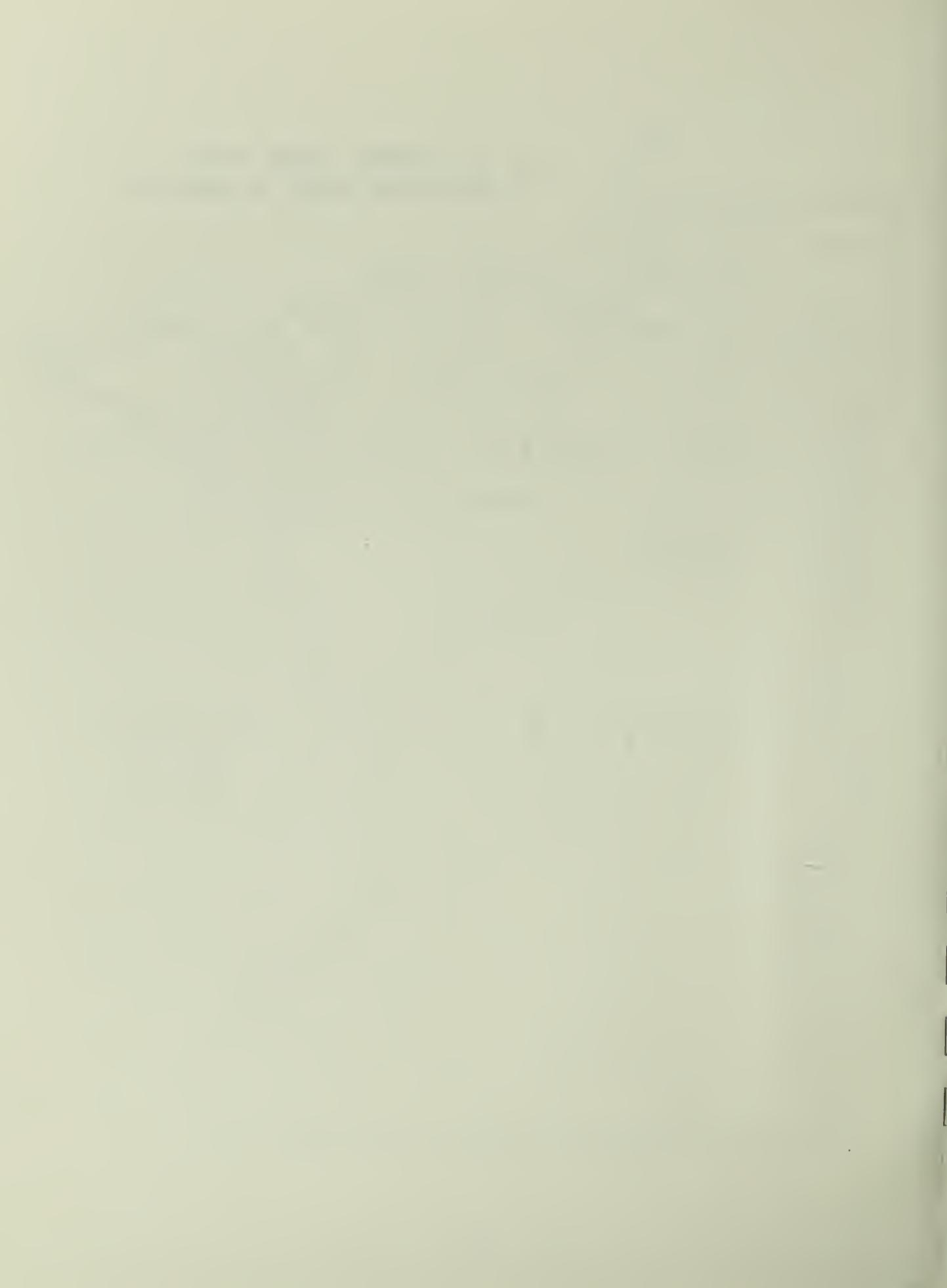
ZONE 5 - 54,603 Square Miles

All that part of Minnesota south and west of the line described as the south and west border of Zone 4.



## MAP OF PROPOSED TIMBER WOLF MANAGEMENT ZONES IN MINNESOTA





## QUANTITATIVE DESCRIPTION OF ZONES

The Team advocates dividing the Minnesota wolf range into four zones, with three different wolf management strategies among them. Thus we felt it necessary to characterize these zones in terms of pertinent factors so as to indicate why different management is necessary in different areas. To do so, we consulted the Minnesota Land Management Information System (MLMIS) within the University of Minnesota's Center for Urban and Regional Affairs (CURA) through Mr. Rodney W. Sando.

To use this system, the boundaries of the proposed Wolf Management Zones were plotted on a map of Minnesota at a scale of 1:500,000. Because the data are available for individual 40-acre parcels described by the Public Land Survey (PLS) system, the boundaries of the study area had to be defined within the PLS. This was done by defining the township within each wolf zone. Because the wolf zone boundaries were irregular, the definition of each analysis site required that individual townships be judged in or out of a particular zone by using a 50 percent rule. Consequently if more than 50 percent of the area of a township was within a particular wolf zone the rule placed the entire township within the wolf zone for the analysis.

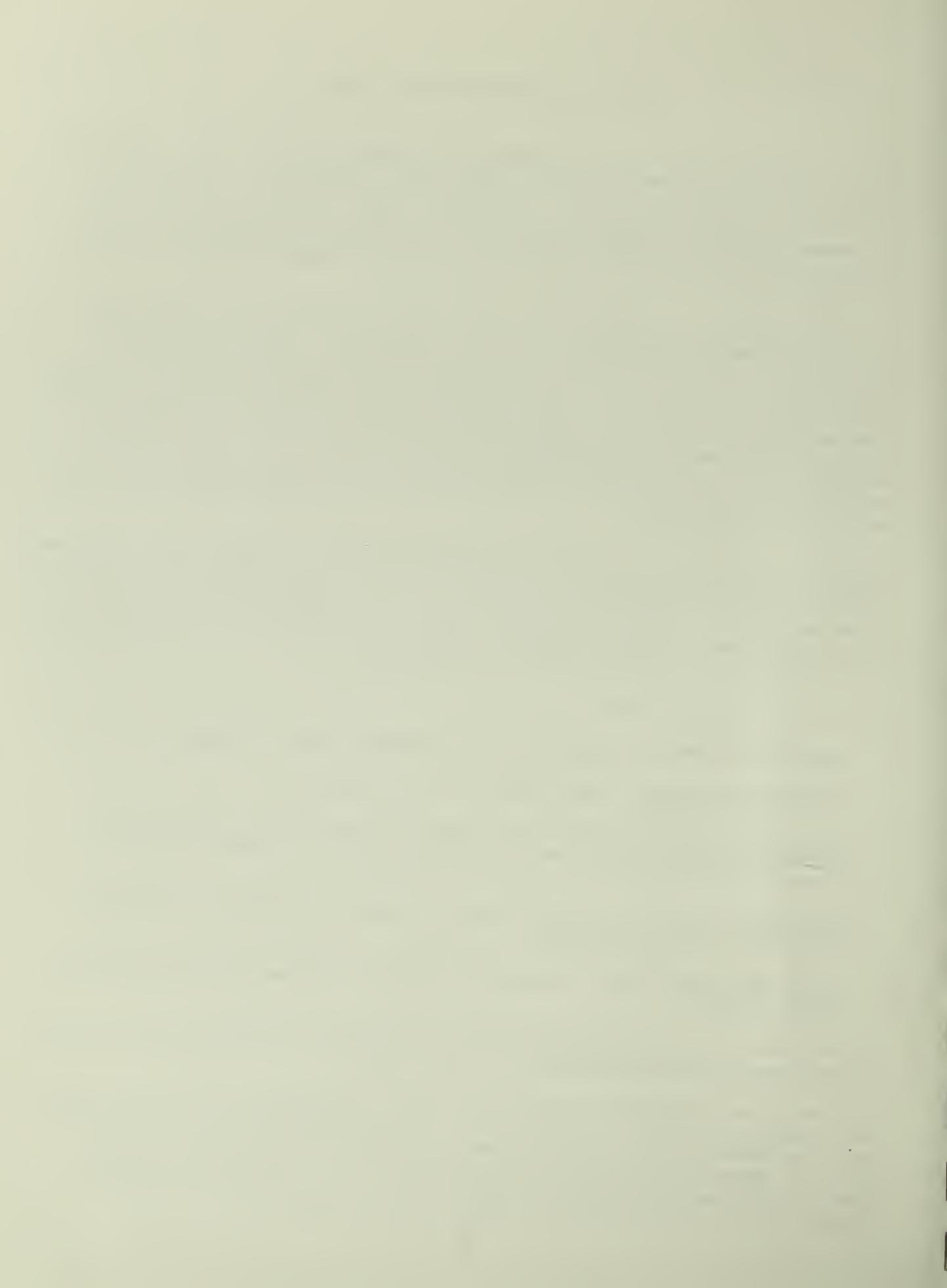
Data were available for the entire area of Wolf Zones 1, 2 and 3. Zone 4 was not entirely covered in the analysis, although a high enough proportion of it was to allow an accurate comparison with Zones 1, 2 and 3. Data were available for the following counties: Aitkin, Beltrami, Carlton, Clearwater, Cook, Hubbard, Koochiching, Lake, Lake-of-the-Woods, Marshall, Roseau and St. Louis. Data were not available for Cass, Crow Wing or Pine Counties.

Data sources were as follows:

1. Land Use: Based on 1:60,000 aerial photography flown in 1969.
2. Highway Orientation: Current maps of county highways.
3. Forest Cover Types: 1960 Forest Survey Type Maps from the North Central Forest Experiment Station and the Iron Range Resources Rehabilitation Commission.
4. Ownership: Data were obtained from the Minnesota Department of Natural Resources current as of 1973.
5. Human Population: Data were obtained from U. S. Bureau of the Census 1970 Census Survey.

Further descriptions of the data sources and methods of collection are available in the System documentations available from MLMIS.

The type of wolf management proposed for Zone 4 is substantially different from that proposed for Zones 1, 2 and 3, so it is the differences between Zone 4 and the other zones that are most important. As stated in the text of the Plan, Zone 4 is generally more accessible and populated, and wolves have a greater chance of interacting with human beings there. This is borne out by several pieces of data from the computer analysis with the MLMIS.



Zones 1, 2 and 3 have from 90 to over 99 percent of their land in forest, water and marsh, whereas only 83 percent of Zone 4 is of these types (Table 1). Thus 17 percent of Zone 4 is composed of cultivated land, pasture, urban residential and other non-wild types of land. Furthermore, these types of land uses are not concentrated in one or two certain areas but are spread throughout Zone 4.

Similarly, 30 percent of the 40-acre parcels in Zone 4 have paved or gravel roads running through them, whereas the figures for Zones 1, 2 and 3 range from 7 to 19 percent (Table 2). If forest and logging roads could be considered also, the difference would be even more striking. This is an excellent measure of the difference in accessibility between Zone 4 and the other zones, and it is accessibility that helps bring wolves and humans into contact.

In determining the types of management to be proposed for various areas, land ownership must also be considered. This is why it is important to note that half of Zone 4 is in private ownership, whereas Zones 1, 2 and 3 have only 19-35 percent of their land in private holdings, and the rest under public administration (Table 4). Generally it is private landowners in wolf areas with whose interests the wolves tend to conflict.

This real and potential conflict between wolves and humans is accented in areas having higher human densities. Again, this is where Zone 4 differs from the other three wolf zones. A much higher percent of Zone 4 has at least 3 people per square mile than do the other zones (Table 5). (Strict comparisons of the figures in Table 5 are not possible because the sizes of the "civil divisions" to which the census data in each density category pertain vary too much. The result, however, is to minimize the differences between Zones 1, 2 and 3 and Zone 4. Despite this, it is clear that a much higher proportion of Zone 4 has a higher human density than most regions of the other zones.)

Thus in human density, accessibility, land use and land ownership, Zone 4 differs substantially from Zones 1, 2 and 3. In all these ways, Zone 4 is less suitable for wolf range than are the other zones.

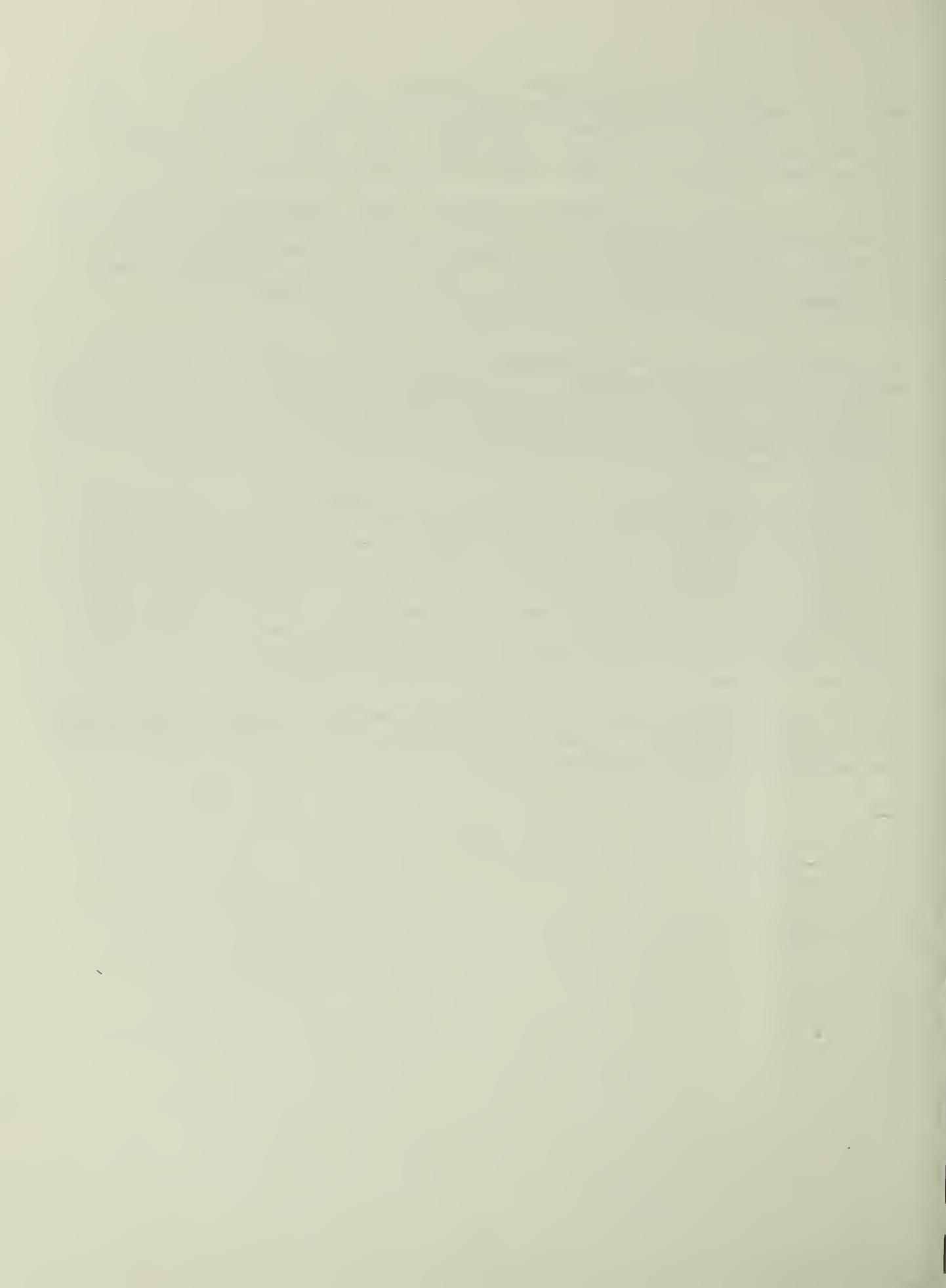


Table 1.--Land Use<sup>1</sup> (Percent)

Land Use	Wolf Zone			
	1	2	3	4
Forested	79	93	76	67
Water	20	3	8	8
Marsh	.5	.5	6	8
Cultivated	0	*	3	7
Urban Residential	.4	.5	*	1
Extractive	*	.8	*	.5
Pasture & Open	*	1.1	5	7
Urban Non-Residential	*	.2	*	.6
Transportation	*	*	*	*
Total	100	100	100	100
Acres	2,853,120	1,122,440	2,085,600	10,751,280 <sup>2</sup>

\*Less than .5 percent

1/ Data Source: 1969 Aerial Photography

2/ Less than total area for Zone 4 because data unavailable for Cass, Crow Wing and Pine Counties.

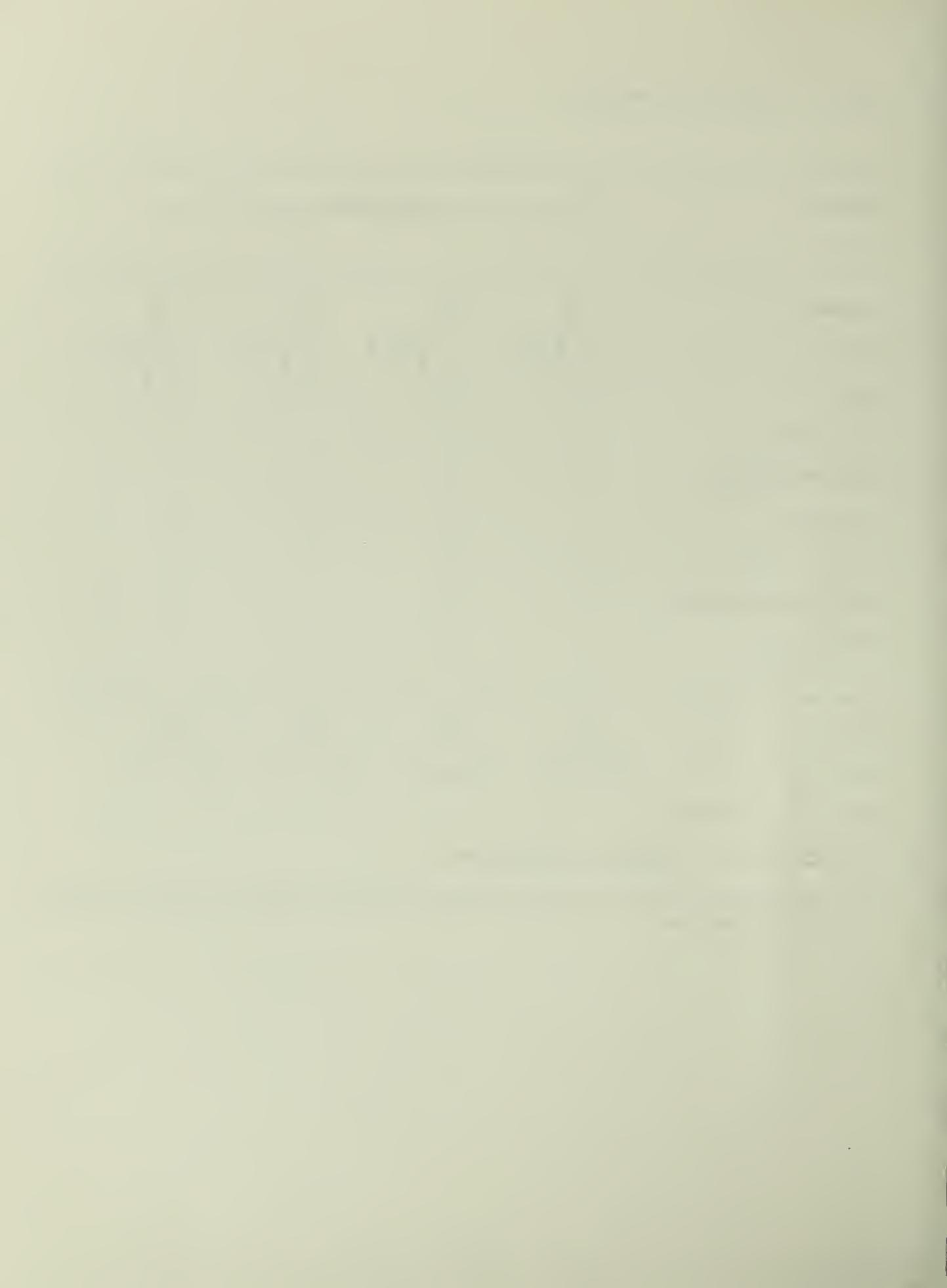


Table 2.--Highway Orientation<sup>1</sup> (Percent of 40-acre parcels in contact with paved or gravel roads)

Highway Orientation	Wolf Zone			
	1	2	3	4
Contact Paved	2 7	5 11	6 16	19 13
Contact Gravel	5			19
Not in Contact	93	84	81	70
Total	100	100	100	100
Acres	2,853,120	1,122,440	2,085,600	10,751,280 <sup>2</sup>

1/ Data Source: Current County Highway Maps

2/ Less than total area for Zone 4 because data unavailable for Cass, Crow Wing and Pine Counties.



Table 3.--Forest Cover Type<sup>1</sup> (Percent)

Cover Type	Wolf Zone			
	1	2	3	4
Non-Forested	21 <sup>2</sup>	7	15	18
White, Red & Jack Pine	32	7	6	5
Spruce-Fir	19	37	44	23
Oak-Hickory	0	0	0	*
Elm, Ash, Cottonwood	*	.5	2	5
Maple-Basswood	1	1	1	3
Aspen-Birch	27	47	27	37
Unproductive	*	1	5	4
Non-Stocked	0	0	*	5
Total	100	100	100	100
Acres	2,853,120	1,122,440	2,085,600	10,751,280 <sup>3</sup>

\*Less than .5 percent

1/ Data Source: 1960 Forest Survey Type Maps, North Central Forest Experiment Station.

2/ Primarily water.

3/ Less than total area for Zone 4 because data unavailable for Cass, Crow Wing and Pine Counties.



Table 4.--Land Ownership<sup>1</sup> (Percent)

Ownership	Wolf Zone			
	1	2	3	4
Private	19	30	35	50
BWCA (Federal)	30	0	0	0
National Forests	31	31	1	5
BIA	2	0	2	4
Other Federal	6	0	*	.5
State	10	14	44	24
DNR Parks	*	*	*	*
County	1	24	13	13
Other Public	1	1	5	3
Total	100	100	100	100
Acres	2,853,120	1,122,440	2,085,600	10,751,280 <sup>2</sup>

\*Less than .5 percent

1/ Data Source: Minnesota Department of Natural Resources and IRRRC

2/ Less than total area for Zone 4 because data unavailable for Cass, Crow Wing and Pine Counties.



Table 5.--Human Population<sup>1</sup> (Percent)

Pop./Sq. Mi.	Wolf Zone			
	1	2	3	4
0.0-1.0	57	34	7	20
1.1-3.0	37	44	73	33
3.1-5.0	3	2	6	17
5.1-10.0	0	0	9	14
10.0 +	3	20	5	16
Total	100	100	100	100
Acres	2,853,120	1,122,440	2,085,600	10,751,280 <sup>2</sup>

1/ Data Source: 1970 Census Data

2/ Less than total area for Zone 4 because data unavailable for Cass, Crow Wing and Pine Counties.



APPENDIX B

PAST, PRESENT AND POTENTIAL EASTERN  
TIMBER WOLF RANGE

Part 1. Areas to be investigated in the Eastern States  
for Eastern Timber Wolf Re-establishment  
Possibilities

Part 2. Map



Part 1.

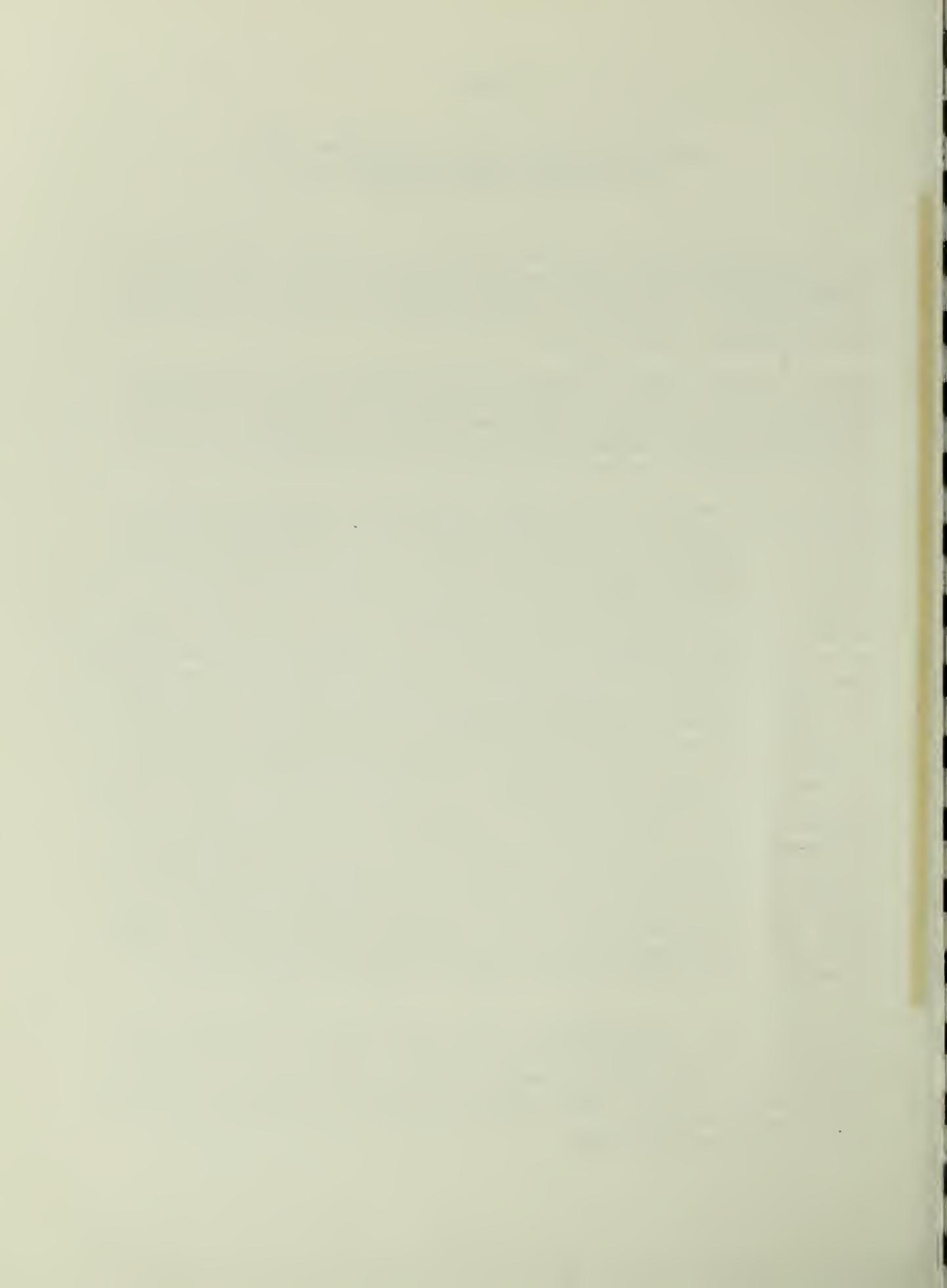
AREAS TO BE INVESTIGATED FOR EASTERN TIMBER  
WOLF REESTABLISHMENT POSSIBILITIES  
(See Item 2, page 14)

In that part of the United States from which the Eastern Timber Wolf has been extirpated, several areas have been delineated that deserve serious investigation for reintroduction possibilities. As this is written, the Recovery Team is uncertain concerning the possibilities for ETW reintroduction in most of these areas.

However, the Team takes cognizance of the desirability for establishing and maintaining separate, viable population centers of the ETW; such a distribution gives greatest protection against catastrophic loss of last remaining population segments and best assures the perpetuation of this (or any) endangered species.

The Team also recognizes that vastly insufficient information exists concerning the ecological and social realities of reintroducing the ETW into areas from which it has been extirpated for a considerable length of time. Thorough studies are needed, prior to any reintroduction, that would determine the status of prey species, the adequacy of habitat factors such as available space and long-term prey food supplies, the probable effect on other wildlife populations in the area, the probable effect on domestic animals that may exist in or near the area under study, the probable reaction of local human residents of the surrounding area and the chances that the ETW could survive human antagonists. The Team is certain that any reintroduction scheme will fail unless the majority of the local human population is desirous of such action, and this will, in most instances, require that local residents be completely apprised of the facts concerning the nature of the ETW as a species, and the facts concerning the procedures for making the reintroduction and the probable effects of such a reintroduction. In general, it is recommended that biological/ecological studies be performed prior to investigations into social reactions and education attempts. If an area is ecologically unsuited to a wolf reintroduction, there is little point in trying to convince local human populations that a reintroduction would be a proper move. This is not to say that local populations should not be informed about ecological studies that may be undertaken or contemplated -- all segments of the program should be completely open to public scrutiny at all times.

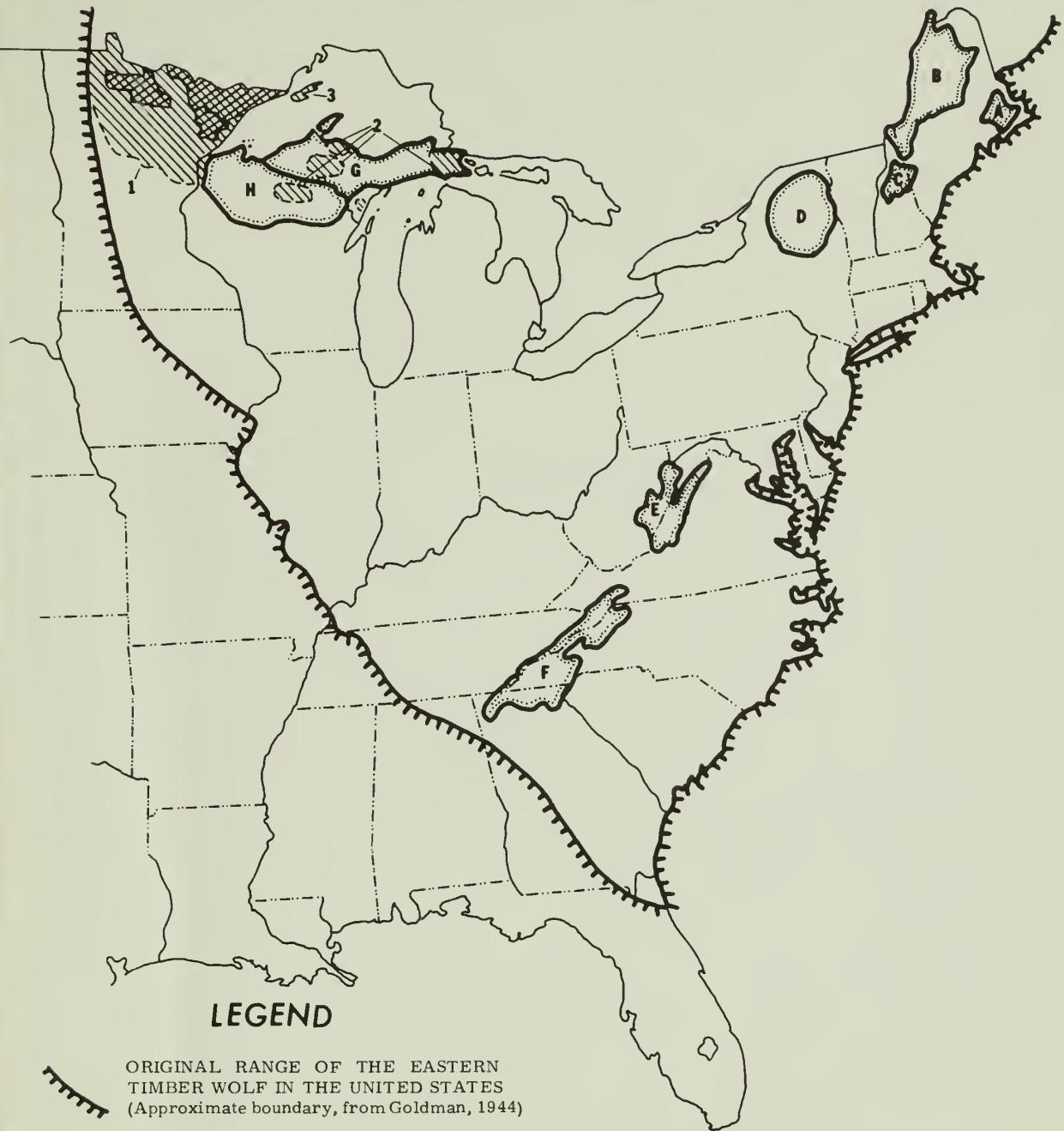
All of the areas recommended for further study have been selected on the basis of (a) low or very low human population levels extant within the area, and (b) large blocks of public lands make up the areas (except much of the land in Maine). These areas are outlined on the map that follows, and lettered "A" through "H". The following brief descriptions apply to each of these lettered areas:



- A. A section of Northeastern Maine, consisting of about 2,500 square miles, much of which is uninhabited on a permanent basis.
- B. Most of Northwestern Maine. A huge area of more than 11,300 square miles with a very low population and in which Maine's Baxter State Park is located. Most of the land, however, is privately owned.
- C. White Mountain Area. This area is almost entirely composed of White Mountain National Forest. It is a little less than 2,500 square miles in extent and contains a low population level.
- D. The Adirondack Forest Preserve Area of Northern New York. Most of this area is occupied by the Adirondack State Forest Preserve, consists of approximately 9,375 square miles, and has a low population level.
- E. Southern Appalachians (Northern Section). Monongahela and George Washington National Forests in the Virginia-West Virginia mountain region. Most of the area has a low population.
- F. Southern Appalachians (Southern Section). The main section of the Southern Appalachians in Western North Carolina and Eastern Tennessee, including smaller portions of Northern Georgia, extreme Western South Carolina and Southwestern Virginia. Federal lands here include National Forests, National Parks, TVA lands and BIA lands. The entire area consists of nearly 14,000 square miles. The lowest population density section contains about 1,500 persons (about 1 person per square mile), and large portions of Great Smoky Mountains National Park are free of human inhabitants.
- G. Upper Peninsula of Michigan. While this area of some 15,000 square miles does contain residual wolf population elements, population strength is marginal at best. One transplant attempt in 1974 proved that, biologically and ecologically, such transplants are possible, but it also proved that the wolf is socially unacceptable to many residents, since all four transplanted wolves died at the hand of man. (Weise, et. al. 1975) Further studies that would narrow the selection of transplant sites (National Forests, National Lakeshore, private lands, etc.) and that would elucidate public acceptance are needed.
- H. Northern Wisconsin. This is an area containing large amounts of public lands but sparse human population, where wolves once lived in relative abundance and still are occasionally seen. An initial survey is required to determine Wisconsin's best existing wolf habitat, followed by ecological studies of specific areas.



# EASTERN TIMBER WOLF AREA STATUS MAP



## LEGEND



ORIGINAL RANGE OF THE EASTERN  
TIMBER WOLF IN THE UNITED STATES  
(Approximate boundary, from Goldman, 1944)



CURRENT RANGE OF THE EASTERN  
TIMBER WOLF IN THE UNITED STATES  
1. Northern Minnesota and adjacent Wisconsin  
2. Upper Michigan and Northern Wisconsin  
3. Isle Royale National Park



PROPOSED EASTERN TIMBER WOLF  
SANCTUARY ZONES IN MINNESOTA



AREAS TO BE INVESTIGATED FURTHER  
FOR REESTABLISHMENT POSSIBILITIES  
FOR THE EASTERN TIMBER WOLF

- A. Northeastern Maine
- B. Northwestern Maine
- C. White Mountains Area
- D. Adirondack Forest Preserve Area
- E. Southern Appalachians (Northern Section)
- F. Southern Appalachians (Southern Section)
- G. Upper Peninsula of Michigan
- H. Northern Wisconsin



## APPENDIX C

### BACKGROUND DATA



# EASTERN TIMBER WOLF RECOVERY TEAM

P.O. Box 190  
Marquette, MI. 49855

Mr. Ralph Bailey, Leader  
Eastern Timber Wolf Recovery Team  
P.O. Box 190  
Marquette, Michigan 49855

September 11, 1975  
Revised, May 13, 1976

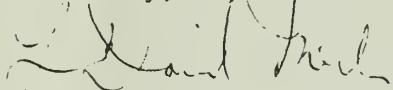
Dear Ralph:

The following provides the figures and reasoning behind Item No. 122-2 of the Eastern Timber Wolf Recovery Plan.

The goal of one wolf per 10 square miles for optimum wolf density in Zones 2 and 3 is based on the fact that such a density existed in the Superior National Forest as recently as winter 1971-72. Although the prey density at that time was unknown, there were sufficient prey available to support one wolf per 10 square miles until about 1971-72 and to support human harvesting of prey as well.

It is apparent that deer habitat has been deteriorating throughout northern Minnesota because of forest maturation and succession, and that this trend must be reversed through logging where permitted, and through fire and/or deliberate habitat management where possible. The Recovery Plan calls for such habitat improvement, and if this is successful, then the goal of one wolf per 10 square miles is worth aiming for.

Sincerely,



L. DAVID MECH  
Wildlife Research Biologist

Ralph E. Bailey, Leader  
Michigan Department of Natural Resources  
P O Box 190  
Marquette, MI 49855

William C. Hickling  
U S Fish & Wildlife Service  
John W. McCormack P.O. & Courthouse  
Boston, MA 02109

Robert M. Linn  
U.S. National Park Service  
Biological Science Dept  
Michigan Technological University  
Houghton, MI 49931

Ron Nicotera  
Wisconsin Department of Natural Resources  
Box 450  
Madison, WI 53701

LeRoy Rutske  
Minnesota Department of Natural Resources  
Centennial Building  
St. Paul, MN 55155

Karl Siderits  
Superior National Forest  
P O Box 338,  
Duluth, MN 55801

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L. David Mech  
U S Fish & Wildlife Service  
North Central Forest Experiment Station  
Folwell Avenue

Robert E. Radke  
U S Forest Service  
633 West Wisconsin Avenue  
Milwaukee, Wisconsin 53203



# EASTERN TIMBER WOLF RECOVERY TEAM

P.O. Box 190  
Marquette, MI. 49855

Mr. Ralph Bailey, Leader  
Eastern Timber Wolf Recovery Team  
P.O. Box 190  
Marquette, Michigan 49855

September 12, 1975  
Revised May 13, 1976

Dear Ralph:

This letter pertains to Item 123-431 of the Recovery Plan, which proposes to allow 100 wolves to be taken annually by public hunting and trapping in Zone 4. This assumes that an additional 60 will be taken by the control program and another 60 illegally. As you know, the reason for this item is to try to maintain the wolf population in Zone 4 at a desired density of one wolf per 50 square miles.

Although the present density is unknown in Zone 4 (see letter of September 10, revised May 13, 1976, in Appendix), estimates ranging from 280 to 410 have been proposed. If it is 410, and if a total of 220 wolves is taken, this amounts to 54% of the population. Because a wolf pack of 2 to 6 animals can increase by 100% to 400% in one year with one litter of 6 pups (Mech 1970), at least 50% of the population must be taken each year merely to maintain the previous density. This was demonstrated in Alaska (Mech 1970:64).

If the population in Zone 4 is actually 280 wolves, or an average of one per 75 square miles, then the assumed illegal kill of 60 animals, and the assumed control take of 60, would be reduced considerably because there would be so few wolves. The recommended public take of 100 wolves, plus 40 killed illegally and/or on the control program, would still amount to only 50% of the population.

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48  
L. David Mech  
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North Central Forest Experiment Station  
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Paul, MN 55101

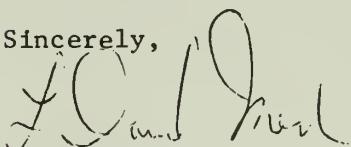
Robert E. Radtke  
U.S. Forest Service  
633 West Wisconsin Avenue  
Milwaukee, Wisconsin 53203



As stated in Item 123-432, the actual quotas in the previous item must be adjusted from year to year according to estimates of the wolf density. These estimates and determination of the general population trend can be facilitated by examination of the data on number, location, age, and sex of the wolves killed.

Because a large sanctuary with a high density of wolves is to be maintained, a continued dispersal of surplus wolves into Zone 4 is anticipated. Thus even if more than the annual surplus of wolves were to be taken in Zone 4, the population would be expected to rebuild soon.

Sincerely,

A handwritten signature consisting of stylized initials "LDM" followed by a surname.

L. DAVID MECH  
Wildlife Research Biologist



# EASTERN TIMBER WOLF RECOVERY TEAM

P.O. Box 190  
Marquette, MI. 49855

Mr. Ralph Bailey, Leader  
Eastern Timber Wolf Recovery Team  
P.O. Box 190  
Marquette, Michigan 49855

September 10, 1975  
Revised May 13, 1976

Dear Ralph:

This is to document the manner in which the estimates of wolves in Minnesota were made for devising various parts of the Eastern Timber Wolf Recovery Plan.

As you are well aware, estimating the numbers, or density, of wildlife is difficult at best, and the wolf is one of the hardest mammals to count. Wolf studies are underway in four areas of Minnesota, including the Superior National Forest, the Beltrami Island Wildlife Management Area, the Moose Willow Wildlife Area, and the Chippewa National Forest. The intensive areas being studied comprise a total of about 7% of the wolf range in Minnesota.

Unfortunately none of the studies is completed, and one has just begun. Thus final figures are not in from any of them. The best we can do at present is to project, within broad limits, an estimate for Minnesota based on the data now available, understanding that such an estimate is subject to change upon the obtaining of additional data, or upon a more complete analysis of the present data. Nevertheless, I am confident that the actual number of wolves in the State is somewhere between the limits given below.

In winter 1971-72 and 1972-73 the density of wolves in the Superior National Forest was estimated at about one per 10 square miles, but was thought to be decreasing due to a drastic decline in the deer herd (Mech 1973). In fact, in my 1,000-square-mile intensive study area in

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Robert M. Linn  
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Biological Science Dept  
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Houghton, MI 49931

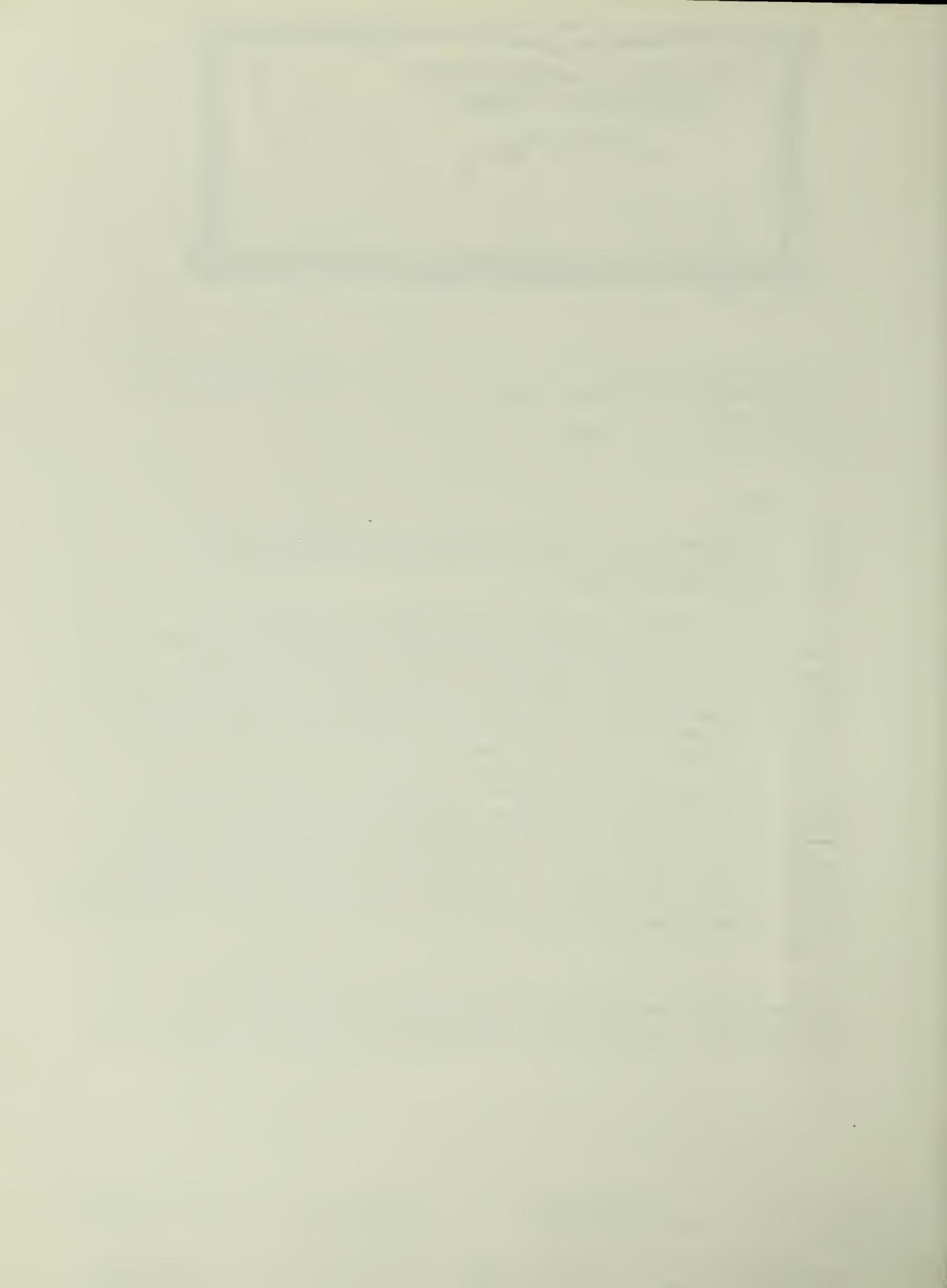
Ron Nicotera  
Wisconsin Department of Natural Resources  
Box 450  
Madison, WI 53701

LeRoy Rutske  
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Centennial Building  
St. Paul, MN 55155

Karl Sjodin  
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North Central Forest Experiment Station  
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C. P. Box AAN-55101

Robert E. Radtke  
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633 West Wisconsin Avenue  
Milwaukee, Wisconsin 53203



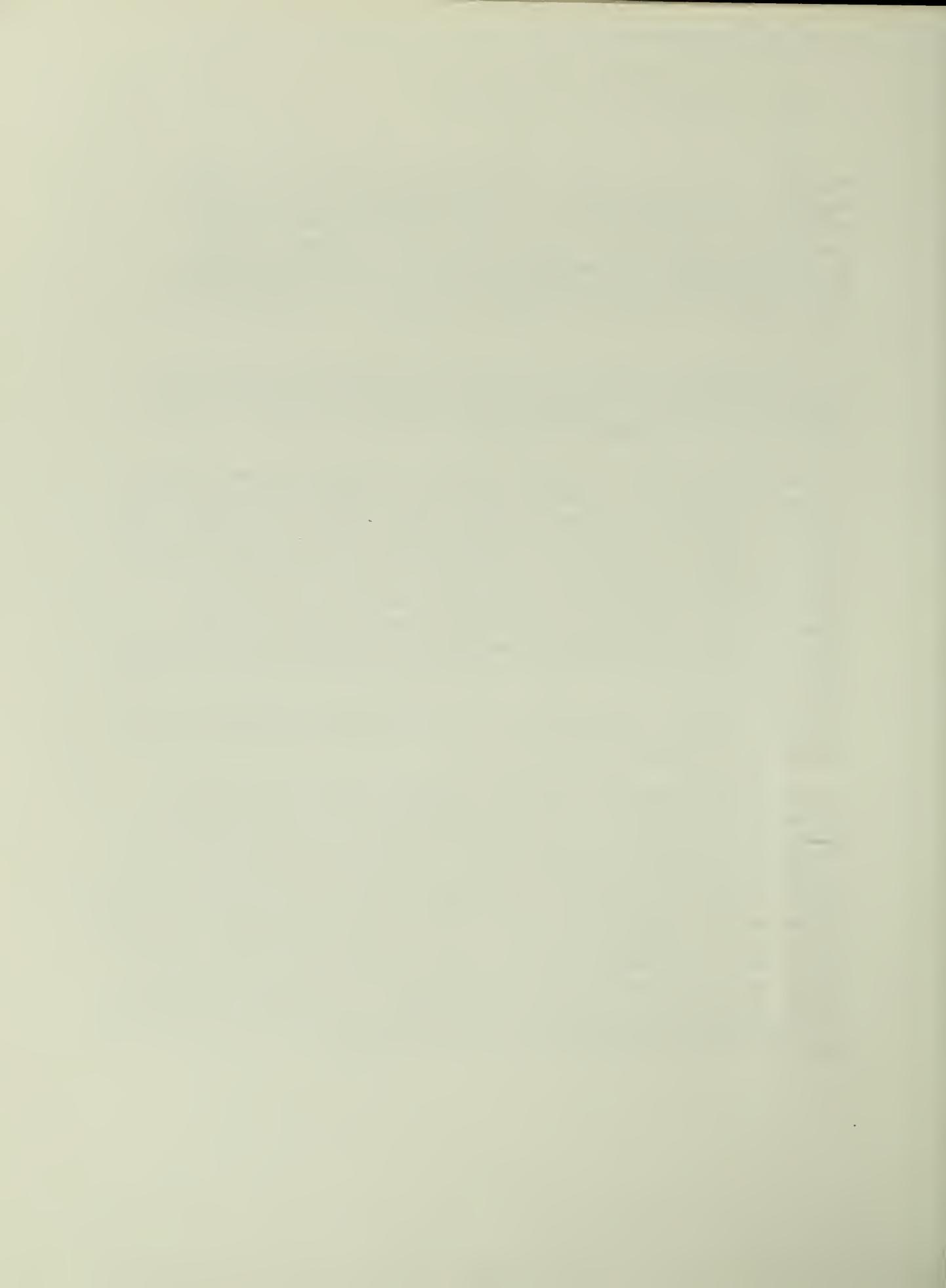
the SNF, the wolf population declined 40% from 1971-72 to 1974-75. However, it then increased in 1975-76 to about 80% of the 1971-72 level or one wolf per 12 square miles (Mech submitted). The best assumption is that this trend reflects actual changes in wolf numbers throughout northeastern Minnesota. Applied to the entire 6,326 square miles of the northeastern part of the Primary Range, Zones 1 and 2, this density yields an estimate of 530 wolves for that area.

If one assumes that the observed decline only took place in the 1,000 square miles, and that the remaining 5,326 square miles still supports one wolf per 10 square miles, the upper estimate for this area would then be about 615 wolves.

In the northwestern 3,501 square miles of the Primary Range (Zone 3), the only wolf density estimate available is from the Beltrami Island Wildlife Management area and vicinity, some 1,000 square miles. There graduate student Steve Fritts (unpublished), University of Minnesota, had preliminary evidence of a density of about one wolf per 17 square miles in winter 1975-76, and an increasing population. Because the Beltrami Island study area is fairly accessible and wolf numbers apparently have been held down there by human factors, the wolf density in the rest of the less accessible northwest probably is not lower. Assuming one wolf per 17 square miles for all of Zone 3 gives 205 wolves.

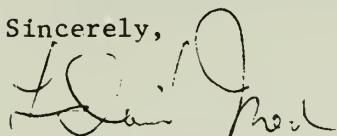
Combining the lower estimates for all of the Primary Range, gives 735 wolves, and the higher estimates, 820.

In the 20,901-square-mile Peripheral Range (Zone 4), the task of estimating wolf numbers is much more difficult because the wolf density is so variable. In some areas there are no wolves, whereas in the Moose Willow area the density of one pack was about one wolf per 13 square miles in 1974-75 (Berg, Minn. DNR, unpublished). Wolf packs are known to inhabit several other areas of the Peripheral Range, but no density figures are available for them. Only educated guesses can be made for the entire area, and mine follow: assuming an average of one wolf per 20 square miles for some 5,000 square miles of Peripheral Range, and an average of one per 100 square miles for the remaining 15,901 square miles, this gives an estimate of 410 wolves. Even a low average estimate of one wolf per 75 square miles for all the Peripheral Range would mean there are about 280 wolves there.

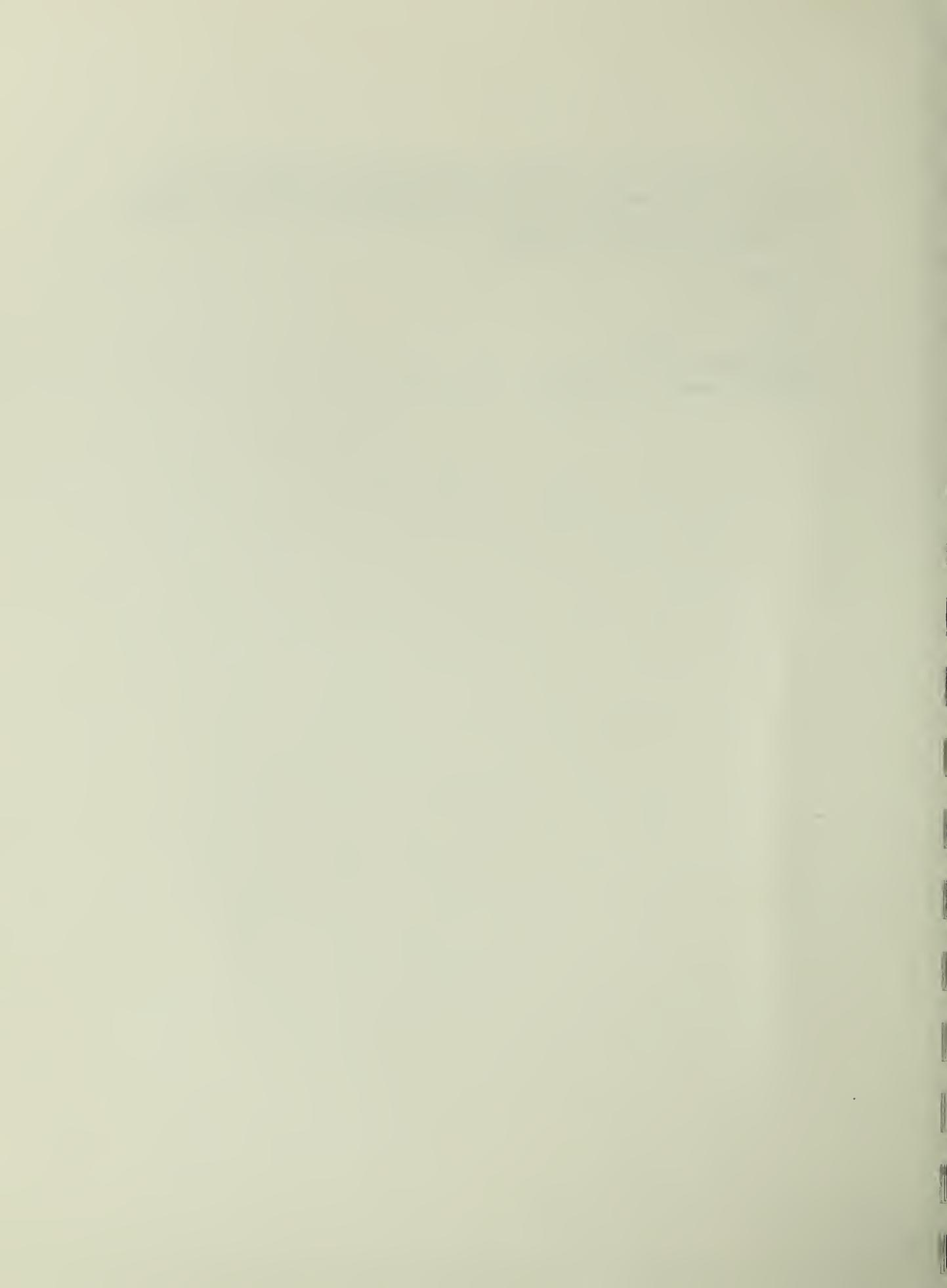


Combining figures for the Primary and Peripheral Ranges gives an estimate of from about 1,000 to 1,200 wolves for Minnesota. Again it should be stressed that this is a preliminary and rough estimate, but the best we have at present.

Sincerely,

A handwritten signature consisting of stylized initials "L.D.M." followed by the surname "Mech".

L. DAVID MECH  
Wildlife Research Biologist



# EASTERN TIMBER WOLF RECOVERY TEAM

P.O. Box 190  
Marquette, MI. 49855

May 19, 1976

Mr. Ralph E. Bailey, Leader  
Michigan Department of Natural Resources  
P.O. Box 190  
Marquette, MI 49855

Dear Ralph:

The Eastern Timber Wolf Recovery Plan recommends certain actions to protect livestock farmers from timber wolf predation. This letter is submitted to provide some background information on the nature of the relationship between wolves and the men who live within the wolf range.

In recent years, persons writing of the timber wolf tend to ridicule the "big, bad wolf" image that was given this animal in the past. Hopefully, this is only the other extreme and a new attitude closer to the truth will develop.

To an individual farmer attempting to make a living for himself and his family, the timber wolf can be, in effect, a very bad animal. It matters not that 99 percent of the area of the contiguous United States has no wolves nor that the loss of livestock to wolves is an extremely minute fraction of the country's total livestock production. What matters is that the wolf can destroy the difference between success and failure for that farmer. The timber wolf has received a bad name because he hurts the livestock raiser in the same way that a hold-up man hurts you.

The wolf has played a crucial role in American history wherever settlements advanced the frontier. By the mid-1600's bounty laws had been passed in almost every one of the American colonies. In some places, payments equaled the budget for all other purposes. (1)

In the days before hunting licenses supplied funds for bounty payments the problem must have been serious to warrant such an expenditure of funds. Other attempts to alleviate livestock losses resulted in hiring hunters by the day to shoot wolves and waiving personal property taxes for those people who kept

---

(1) The Story of American Hunting and Firearms. Outdoor Life. McGraw Hill.  
1959.

Ralph E. Bailey, Leader  
Michigan Department of Natural Resources

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hounds capable of killing wolves. The Cape Cod area of Massachusetts seriously considered building high wooden fences around settlements just to keep out wolves.

Old records give adequate testimony to the seriousness of wolf predation to early settlers who had to use every resource to meet the problem.

In the West, as buffalo herds were depleted and the plains were turned to cattle grazing land, the wolf did not disappear but began to prey heavily on livestock. The problem was severe enough for local livestock associations to offer their own bounties of \$35 to \$50 in addition to existing county, state, and federal bounties. This kind of money, directly from the pockets of stockmen rather than from taxpayers, can only indicate a real problem.

As late as 1918, the president of the New Mexico College of Agriculture estimated an annual loss of 34,000 cattle and 165,000 sheep to wolves in that state.

The grey wolf was eventually exterminated from the West -- but only after widespread poisoning campaigns were in effect for many years. No doubt the livestock industry could have succeeded with something less than total destruction of the wolf but that it did take place attests to something more valid than a Little Red Riding Hood Complex.

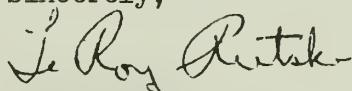
The battle between Minnesota farmers and predators has been largely confined to coyotes in the recent past, since control efforts and lack of protection had restricted timber wolves to the wilderness areas of northeastern Minnesota where they could exist in relative security.

With increased protection in much of the wolf range and finally total protection under the Endangered Species Act, the timber wolf is expanding beyond the wilderness areas and is once again becoming a liability to stock growers.

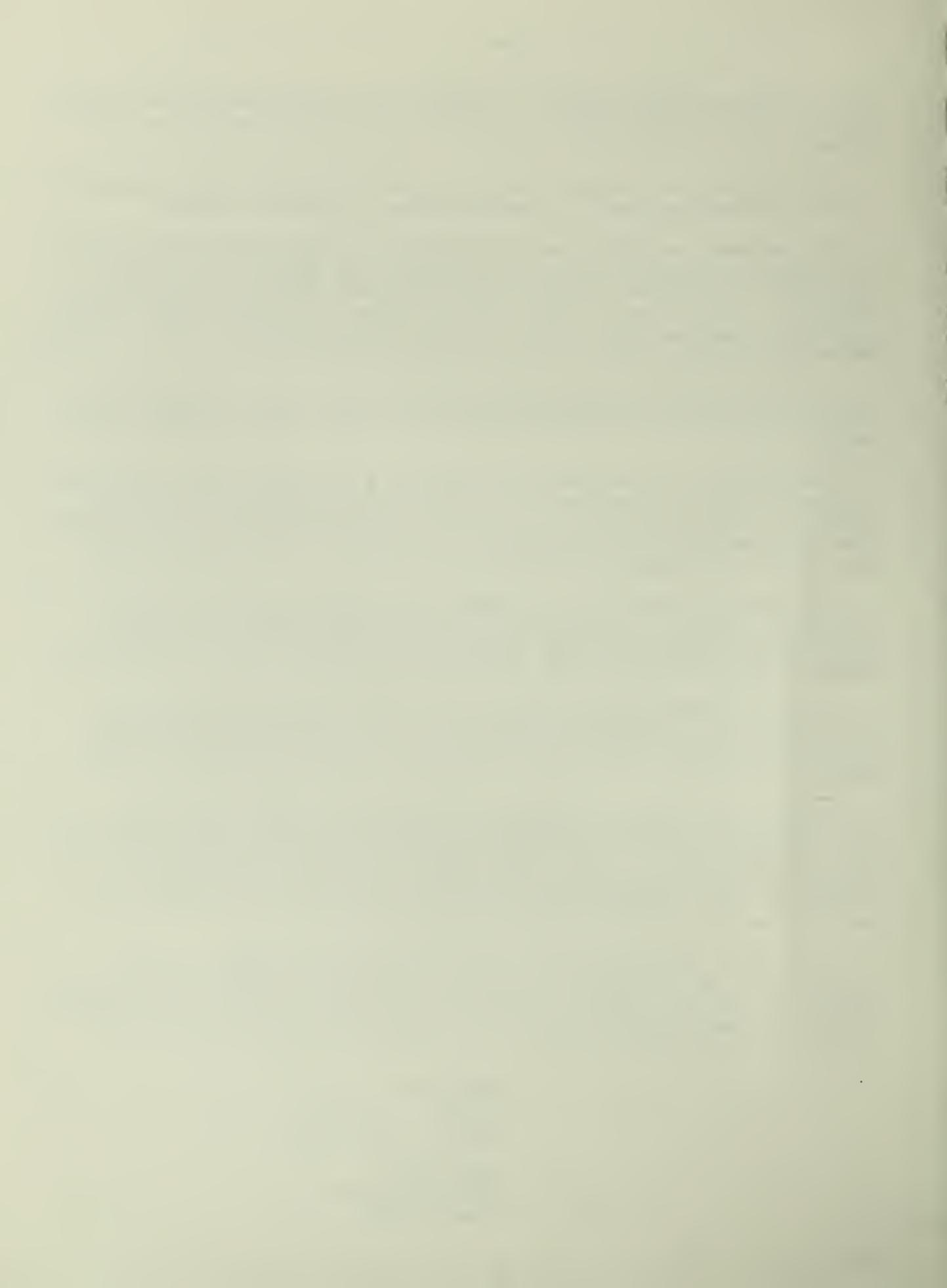
A map on the next page shows the distribution of sheep in northern Minnesota during 1968-69. Although many of the farmers have since switched to beef calf production, the map remains valid for depicting farming areas. The timber wolf population in proximity to these areas must be maintained at a compatible level or severe conflicts will arise that are of no benefit to the wolf or those who seek his complete protection.

The wolf is an integral part of our wilderness environment. It is necessary to a natural balance in wilderness ecology. However, in our current fascination with this animal, we must not forget that outside of the wilderness the view of large wolf populations as a menace to livestock raising is NOT folklore or misconception.

Sincerely,



LEROY RUTSKE  
Wildlife Specialist  
Minnesota DNR



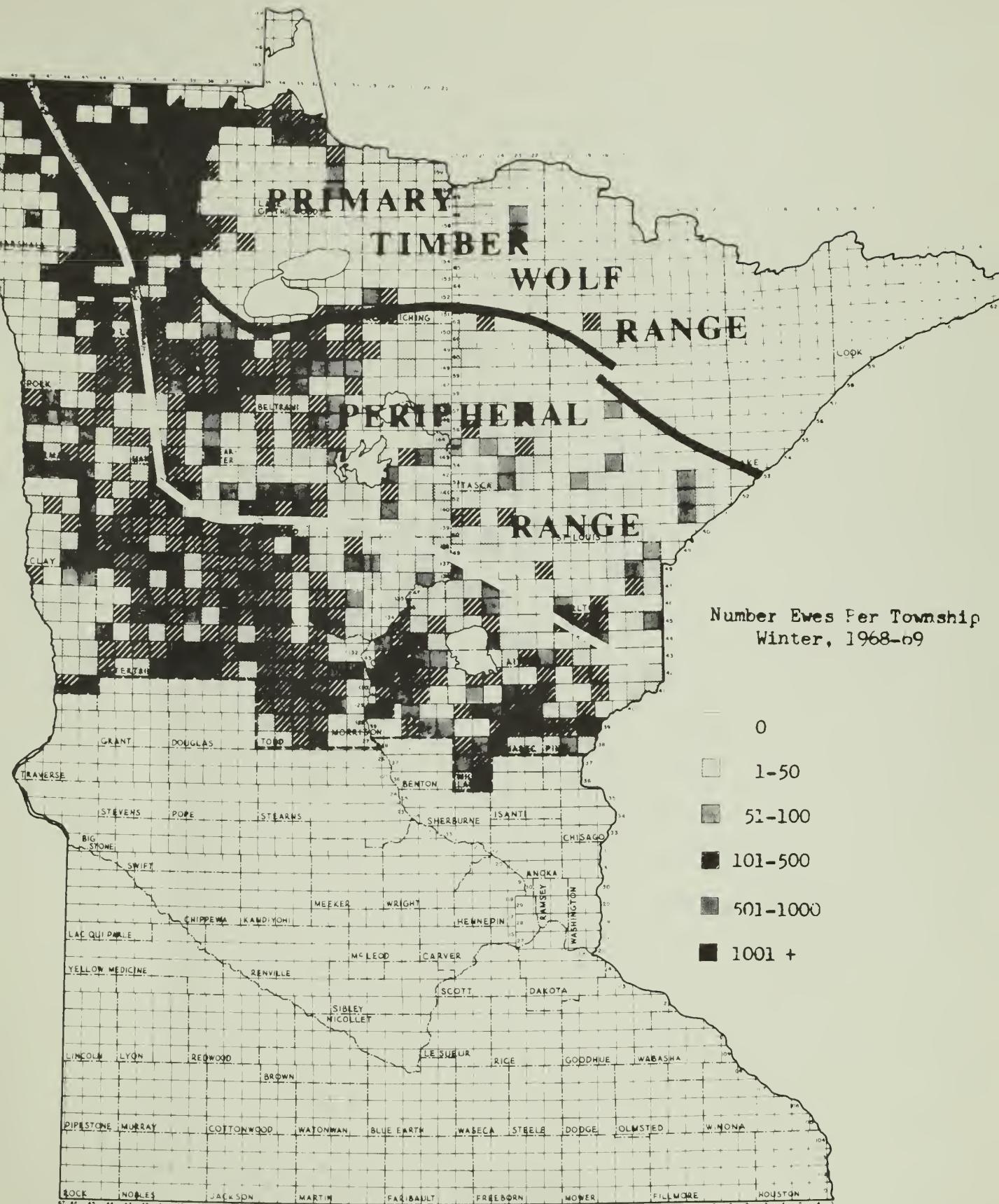


Fig. . Distribution of sheep in northern Minnesota  
 Source: 1969 State Farm Census, USDA Statistical Reporting Service  
 Wolf Range According to Minn. Dept. of Natural Resources



APPENDIX D

MINORITY REPORT



# EASTERN TIMBER WOLF RECOVERY TEAM

P.O. Box 190  
Marquette, MI. 49855

September 23, 1975

Mr. Ralph E. Bailey, Chairman  
Timber Wolf Recovery Team  
P. O. Box 190  
Marquette, Michigan 49855

Dear Ralph:

As a member of the Eastern Timber Wolf Recovery Team, I would like to file a statement with the Team that presents a difference in recommendations: a minority report.

As you know, the Minnesota Department of Natural Resources petitioned the U.S. Department of the Interior in October of 1974 to exclude Minnesota from the range over which the eastern timber wolf is considered endangered. Evidence was cited to substantiate Minnesota's position that the timber wolf was neither threatened or endangered within the state.

While serving on the Recovery Team I have re-asserted this position. Evidence presented during deliberations of the Team has not weakened Minnesota's petition but has strengthened it. Please put me on record as recommending the total declassification of the timber wolf within Minnesota.

I would also like to go on record as opposing the establishment of a timber wolf sanctuary in Koochiching and Lake of the Woods Counties. If Minnesota's petition to declassify the wolf is not accepted and wolf sanctuaries within the state are required, the sanctuary designated by the Recovery Team for most of Cook, Lake and St. Louis Counties is more than adequate.

The proposed sanctuary in Koochiching and Lake of the Woods Counties is surrounded by livestock-raising areas and wolves dispersing from it will be a

Ralph E. Bailey, Leader  
in Department of Natural Resources  
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William C. Johnson  
U.S. Forest Service  
John W. Nichols  
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Robert M. Dunn  
City of Milwaukee  
Milwaukee, WI 53201  
Milwaukee County, Wisconsin  
Milwaukee, WI 53201

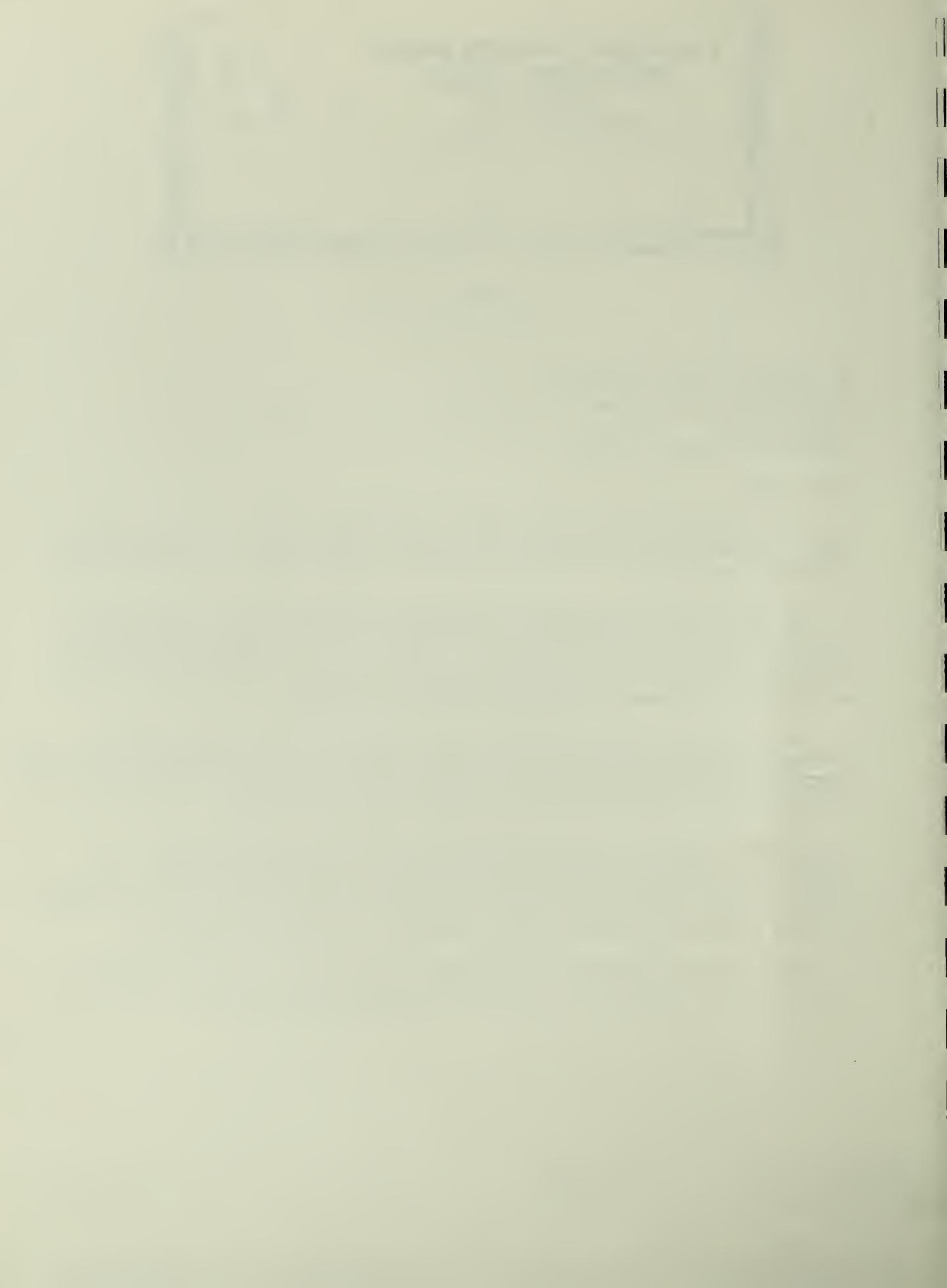
Ron Nicotera  
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LeRoy Radke  
Minnesota Department of Natural Resources  
Centennial Building  
St. Paul, MN 55155

John D. Moore  
U.S. Fish and Wildlife Service  
Marquette, MI 49855

John D. Moore  
U.S. Fish and Wildlife Service  
Milwaukee, WI 53201  
Milwaukee, WI 53201

Robert E. Radke  
U.S. Forest Service  
643 West Wisconsin Avenue  
Milwaukee, Wisconsin 53203



continual management problem. The inaccessible interior of this area will provide sufficient security for a normal wolf population without the sanctuary status. Providing complete protection to the perimeter areas will increase the wolf population above an acceptable socio-economic level and will increase local public hostility toward wolf management programs.

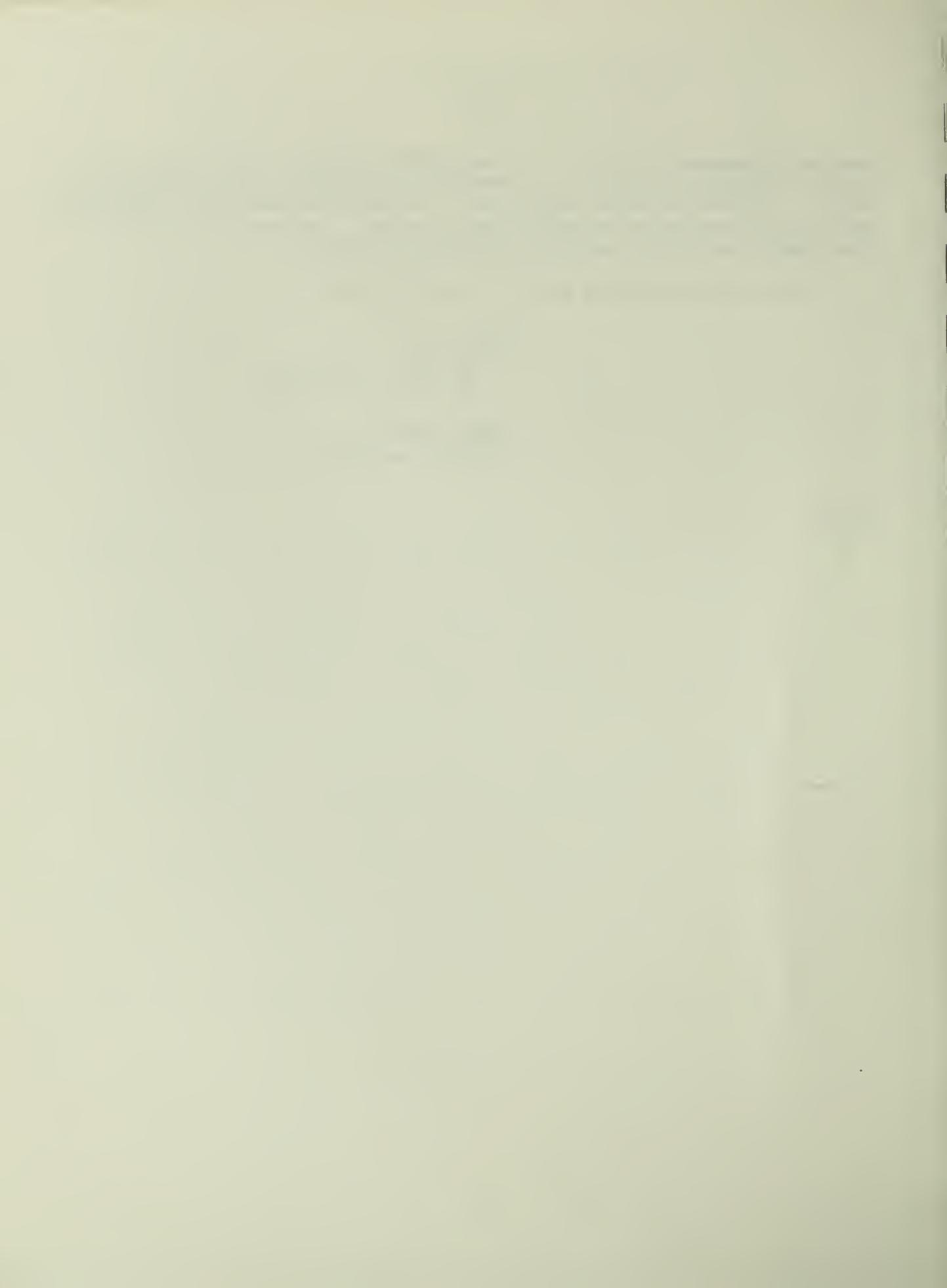
Please make these views a part of the Team Report.

Sincerely,



LEROY RUTSKE  
Wildlife Specialist

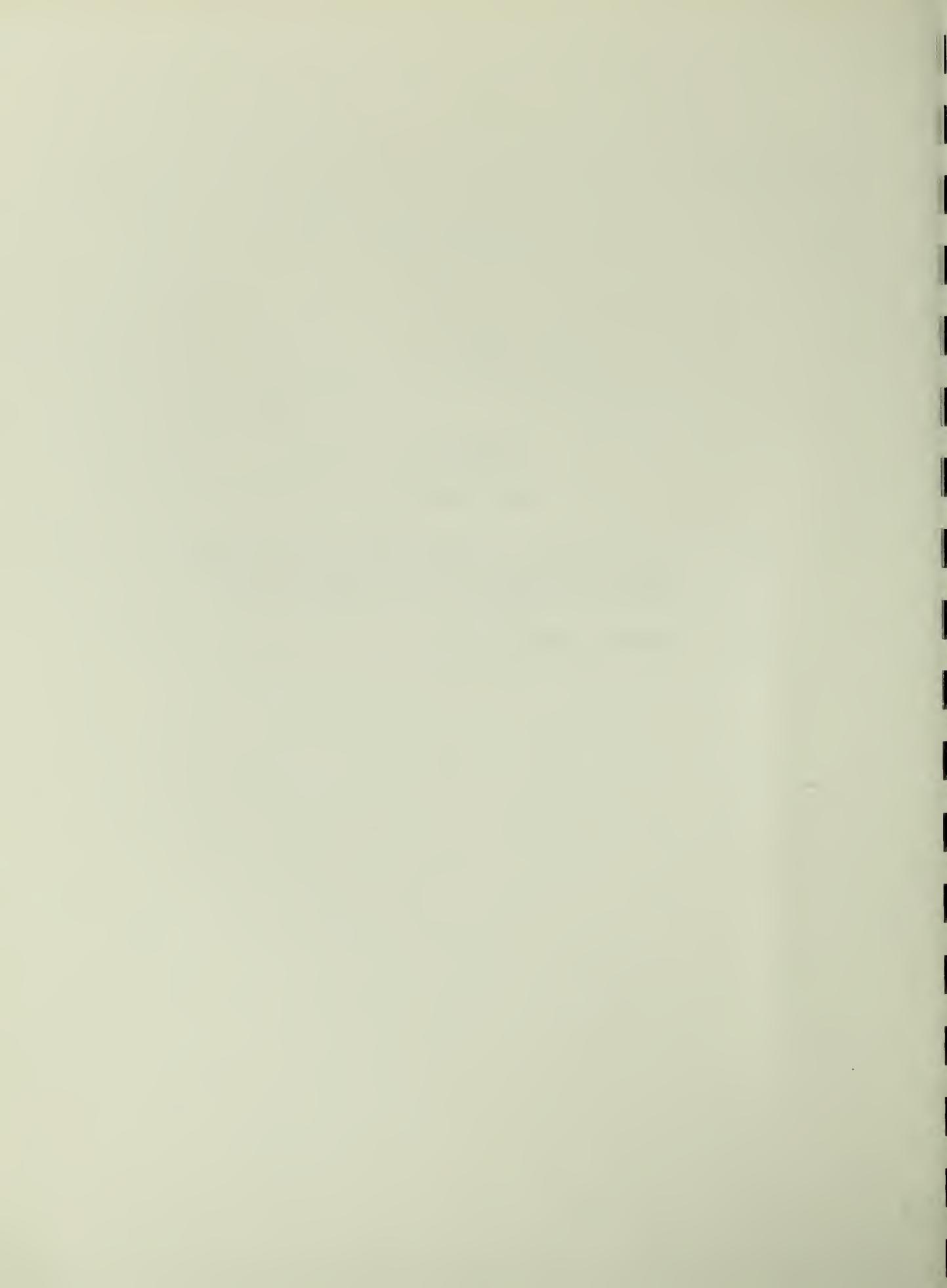
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APPENDIX E  
CORRESPONDENCE

Part 1. List of Agencies, Organizations and Individuals  
Who Were Sent Copies of the First Draft for  
Review, and Comment

Part 2. Comments on Draft Plan



## CORRESPONDENCE

Copies of the first draft of the Recovery Plan were sent to the following individuals, groups and agencies for review:

Dr. Durward Allen  
Dept. of Forestry and Conservation  
Purdue University  
Lafayette, Indiana 47907

Mr. Ulysses S. St. Arnold  
Bureau of Indian Affairs  
Room 3070, Interior Building  
Washington, D. C. 20240

Mr. Ed Brigham  
North Midwest Regional Office  
National Audubon Society  
R.R. #4  
Red Wing, Minnesota 55066

CWD  
Canadian Wolf Defenders  
Box 3480 "D"  
Edmonton, Alberta  
T5L 4J3

Dr. Eugene V. Coan  
Office of the Executive Director  
Sierra Club, Mills Tower  
San Francisco, California 94104

Mr. Bernard W. Corson, Director  
Fish and Game Department  
34 Bridge Street  
Concord, New Hampshire 03301

Wallace C. Dayton  
Big Game Club  
Room 505, Peavey Building  
Minneapolis, Minnesota 55402

Dr. Ray Anderson  
Dept. of Wildlife Ecology  
University of Wisconsin  
Stevens Point, Wisconsin 54481

Mr. James L. Biggane, Commissioner  
Department of Environmental Conservation  
50 Wolf Road  
Albany, New York 12201

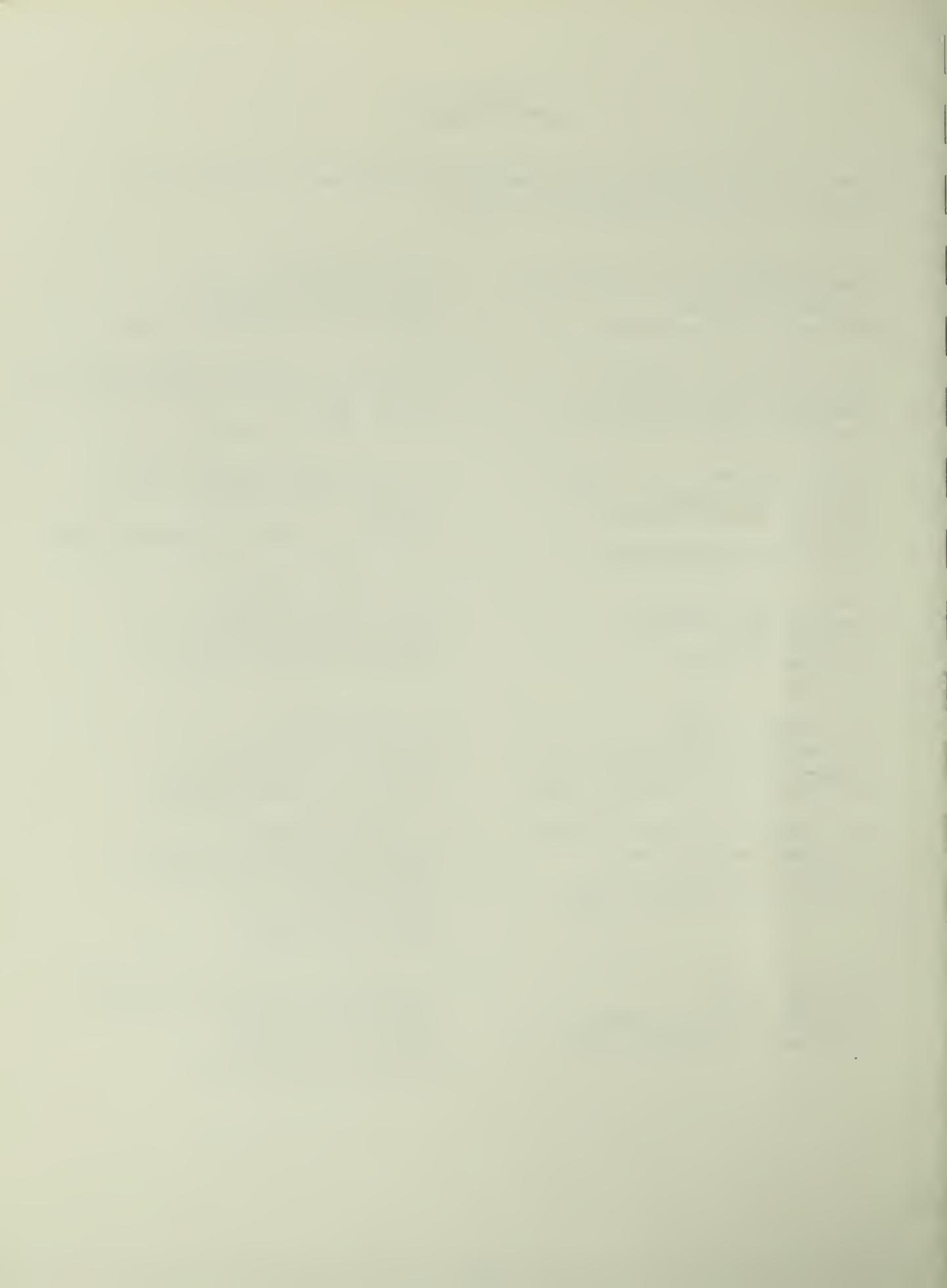
Mr. Merle Brooks, Superintendent  
Voyageur National Park  
Box 50  
International Falls, Minnesota 56649

Dr. Robert E. Chambers  
Dept. of Forest Zoology  
State University of New York  
Syracuse, New York 13210

Dr. Robert Cook  
Wildlife Department  
University of Wisconsin  
Green Bay, Wisconsin 54300

Dr. Malcolm Coulter  
Associate Director for Wildlife  
School of Forest Resources  
Nutting Hall  
University of Maine  
Orono, Maine 04473

Dr. James E. Deacon, Prof. of Biology  
The Ecological Society of America  
Department of Biology  
University of Nevada  
Las Vegas, Nevada 89109



Mr. Anthony S. Earl  
Wisconsin DNR  
Box 450  
Madison, Wisconsin 53701

Dr. Fred G. Evenden, Executive Director  
The Wildlife Society, Suite S-176  
3900 Wisconsin Avenue NW  
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Mr. Bernard Fensterwald, Jr.  
910-16th Street NW  
Friends of Animals, Inc.  
Washington, D. C. 20006

Mr. Stuart Free, Chief  
Bureau of Wildlife  
N.Y.S. Dept. of Environmental Cons.  
50 Wolf Road  
Albany, New York 12201

Dr. Dan Frenzel  
Dept. of Entomology, Fisheries & Wildl.  
University of Minnesota  
St. Paul, Minnesota 55108

Mr. Steve Fritts  
Norris Camp  
Box 114  
Minnesota Game & Fish Department  
Roosevelt, Minnesota 56673

Mr. Tom Garrett  
Wildlife Conservation Director  
Friends of the Earth  
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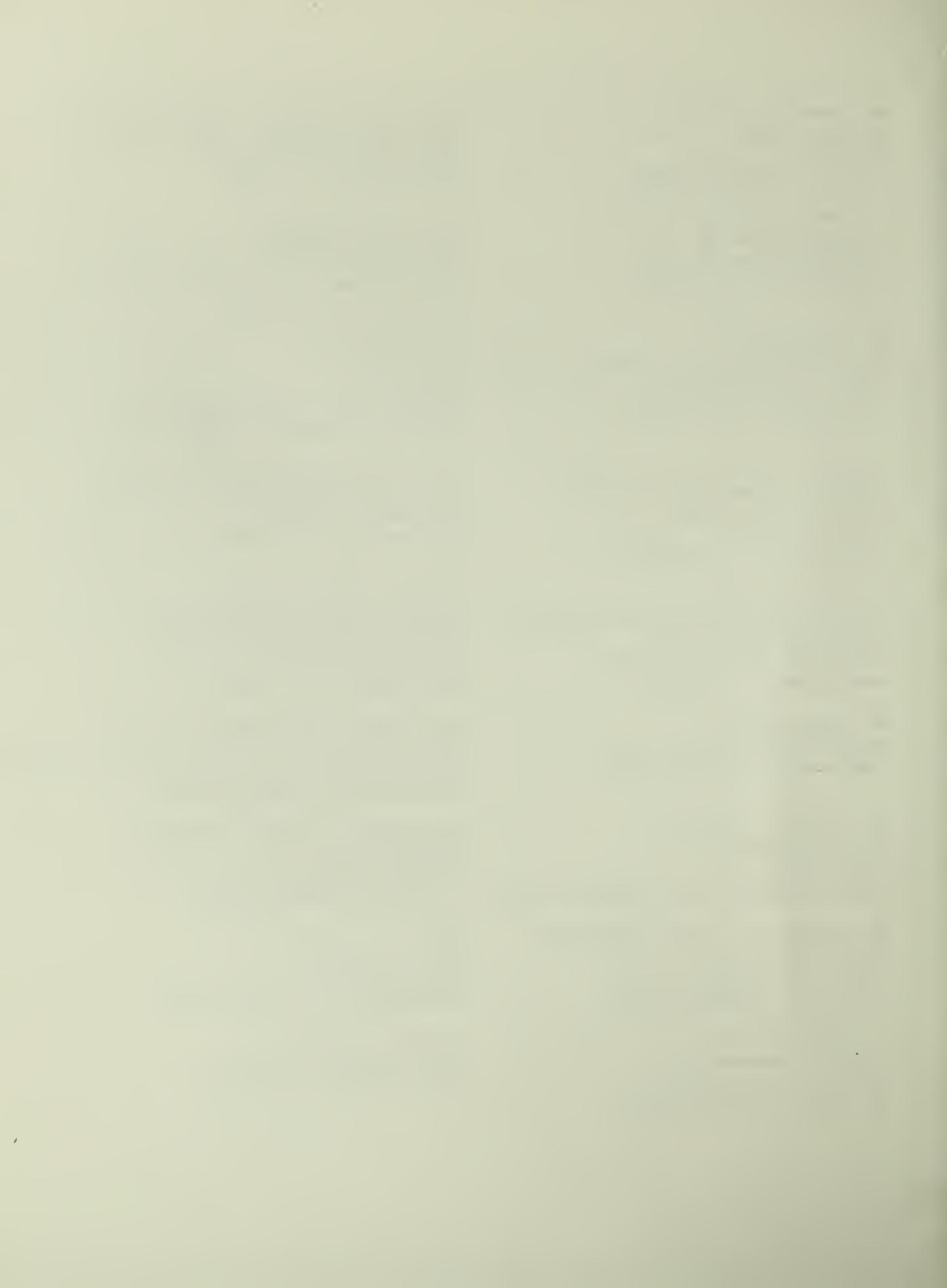
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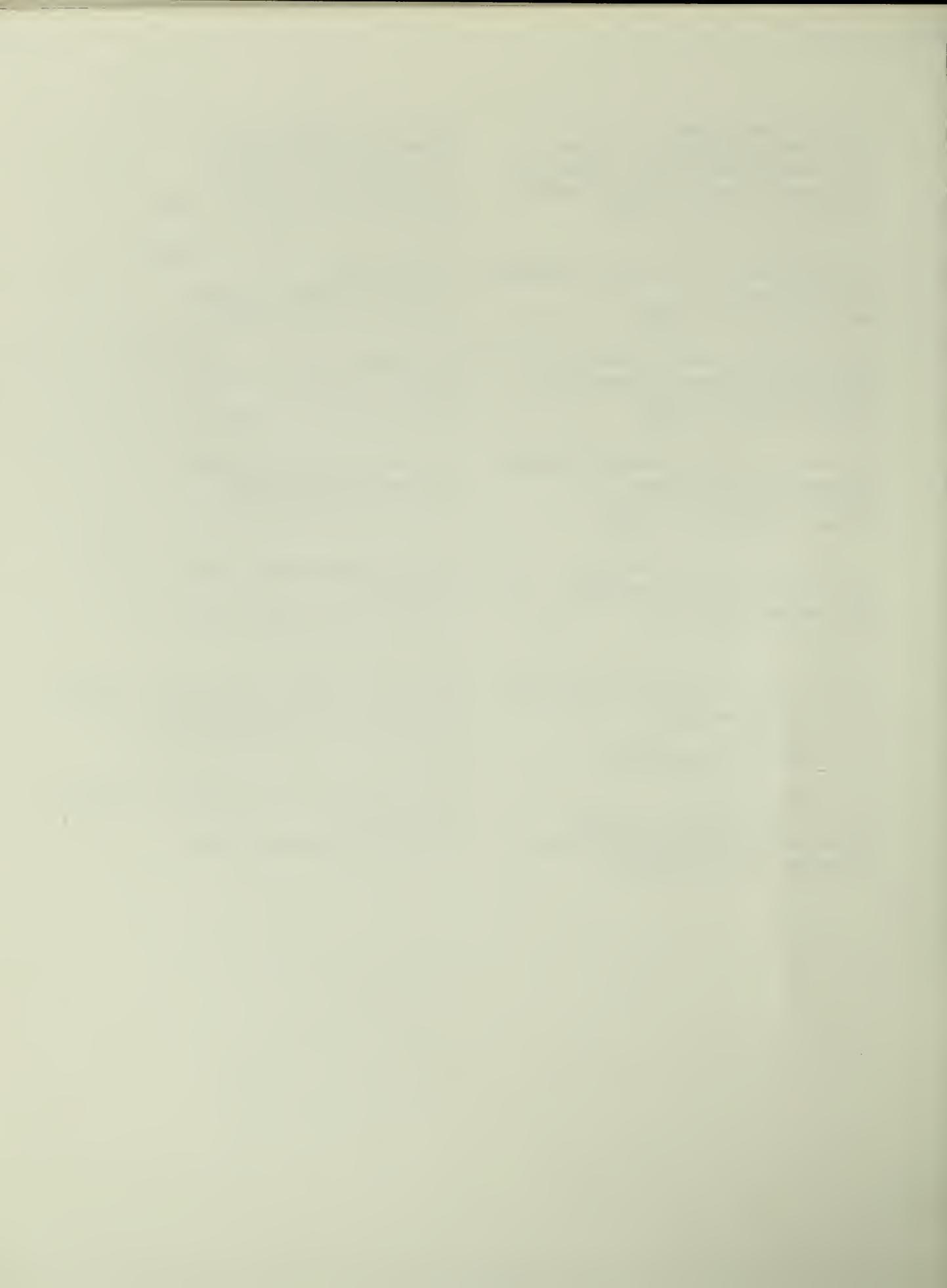
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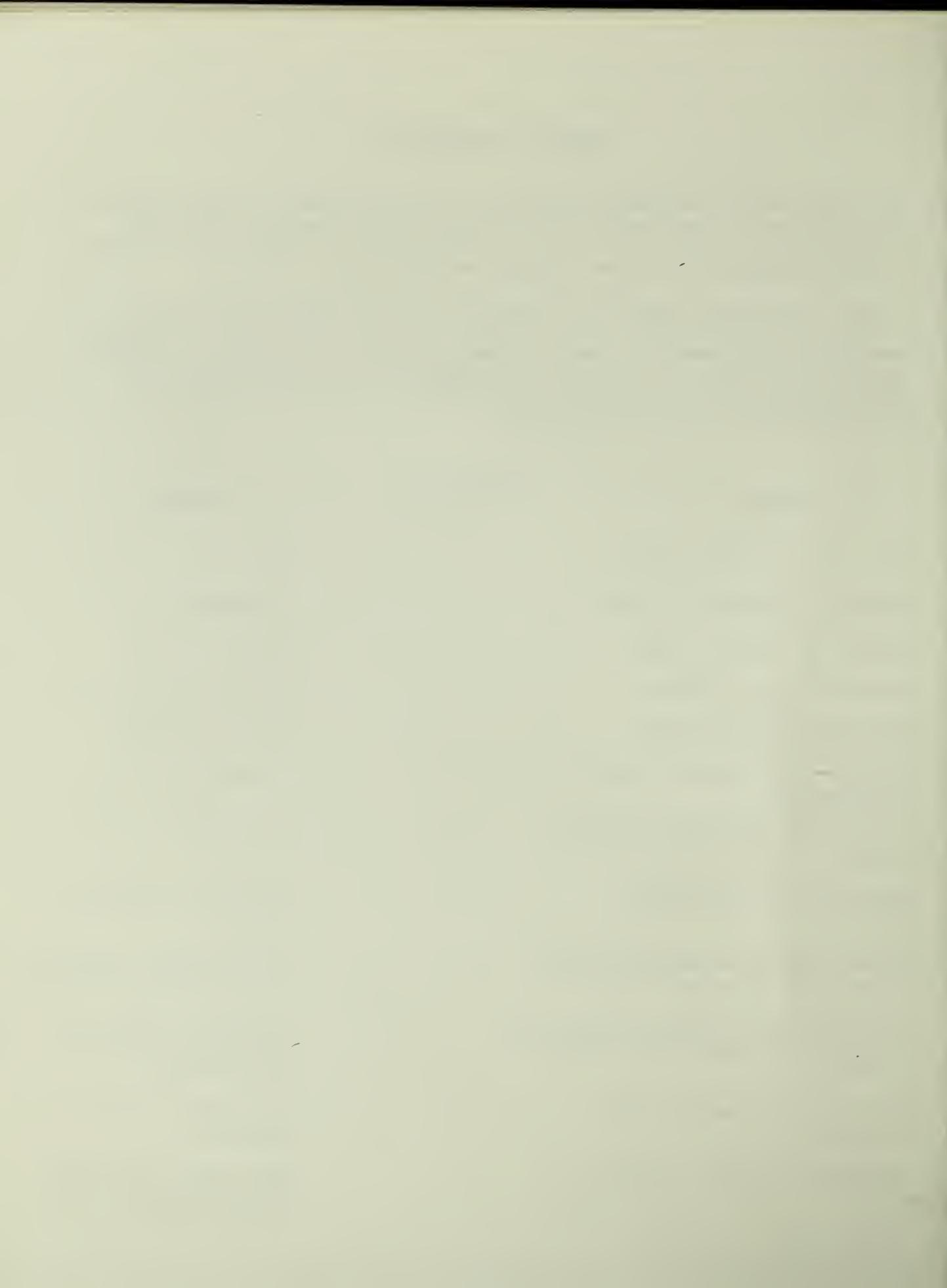


## COMMENTS ON DRAFT PLAN

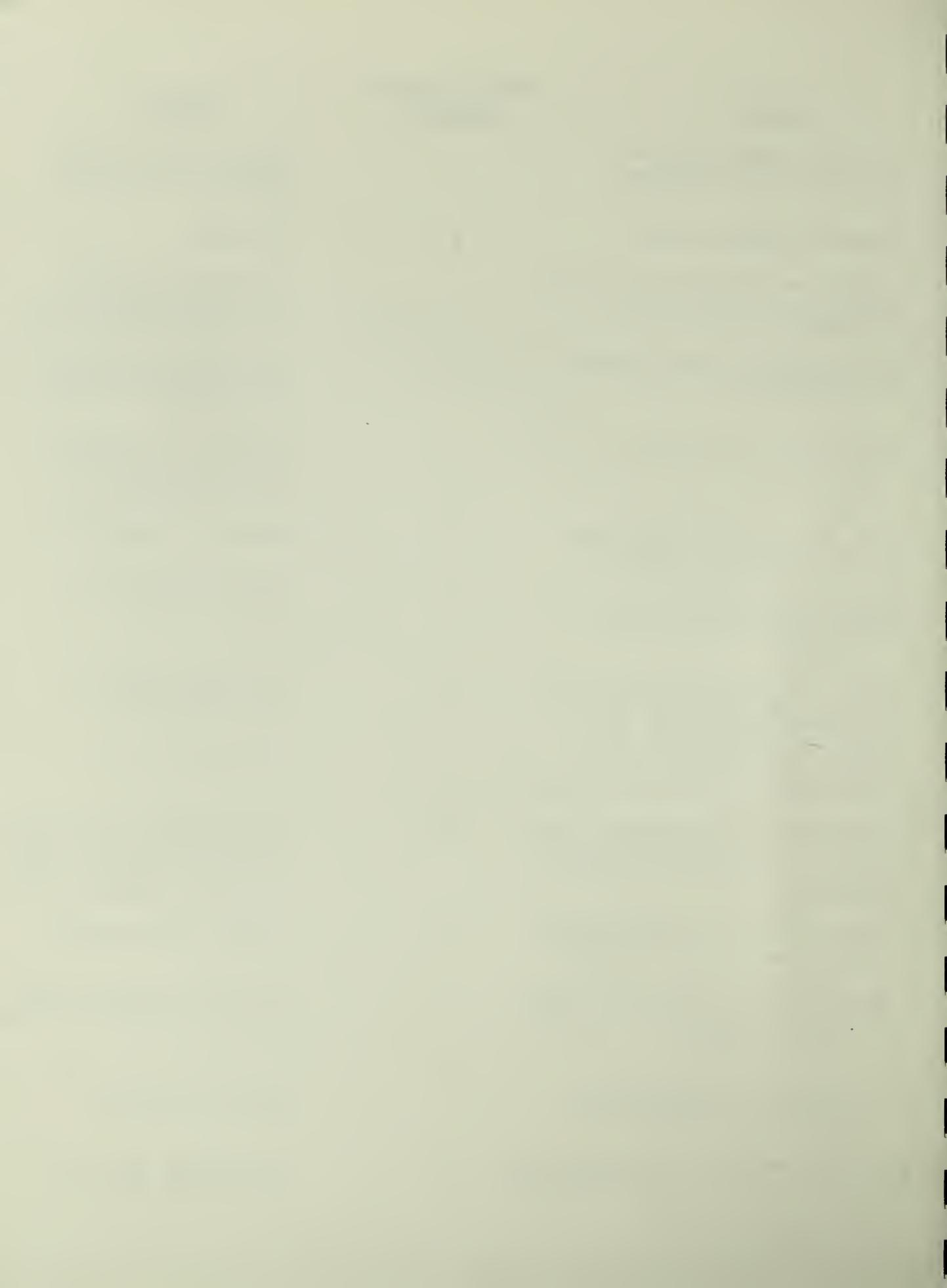
The first draft of the Recovery Plan was sent to eighty-two different agencies, organizations and individuals for critical review and comment. Fifty-nine responses were received. As a result of these comments, the Plan was revised in several places and the Team's objectives and rationale clarified.

It was impractical to completely catalog all of the thoughts and ideas expressed by the respondents. For the reader's convenience, however, a general summary of these comments is here provided plus Team comments where it seemed appropriate. Copies of the letters of response are available through the Regional Director, U. S. Fish and Wildlife Service, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111.

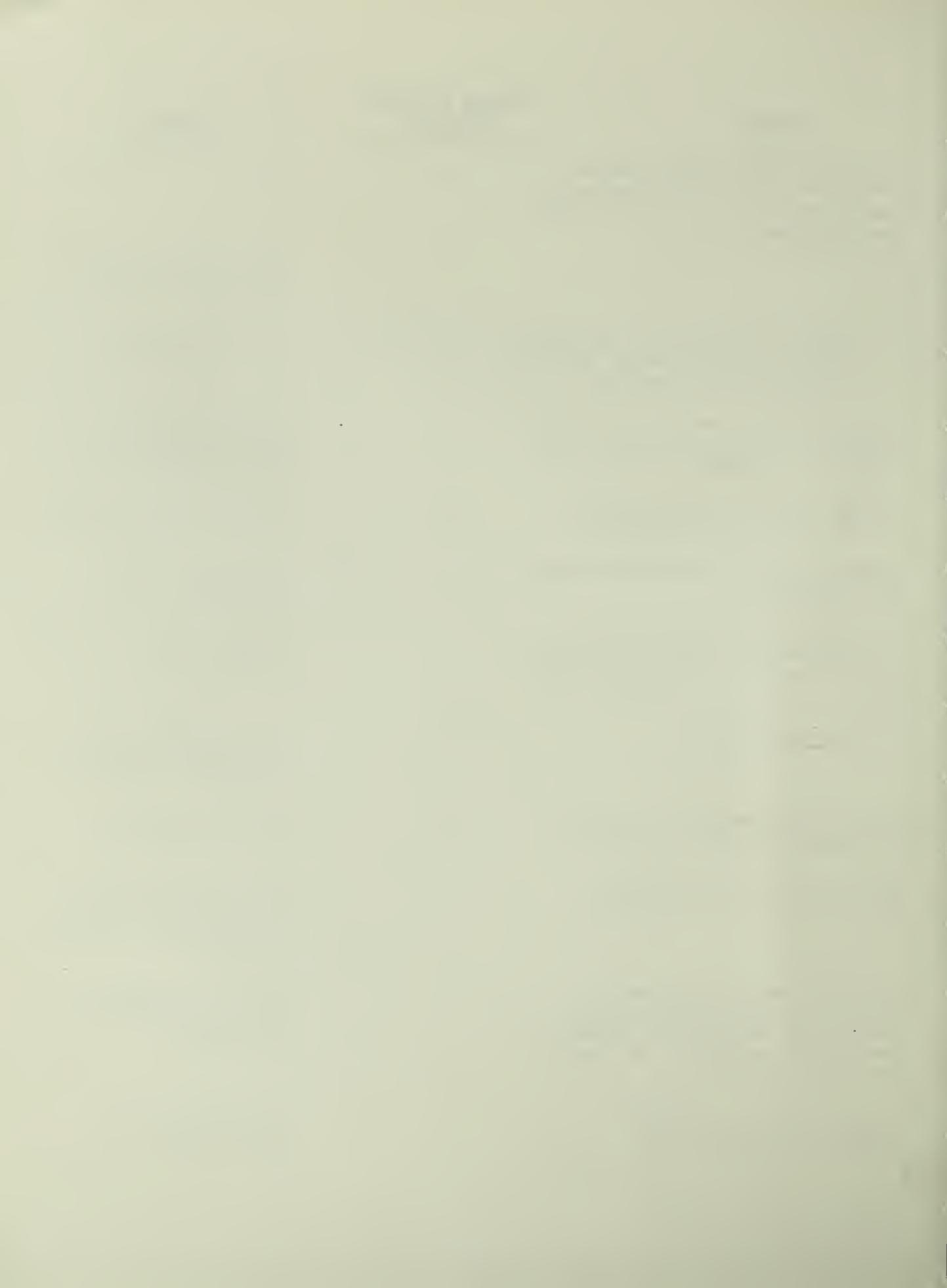
<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Generally favorable to Plan	24	Thank you
Generally unfavorable to Plan	2	No comment
Opposed to logging in BWCA	1	Not part of Plan
Supports logging in BWCA	1	Not part of Plan
Fire practices OK in BWCA	1	Not part of Plan
Agree with "threatened" category in Minnesota	7	No comment
Supports reestablishment in former range	7	No comment
Unfavorable to NW Sanctuary (Zone 3)	6	Adjustments were made in Zone 3
Oppose changing "endangered" status of wolves in Minnesota	3	Do not concur - see Plan - "Recommended Classification"
State consultants should be appointed to Team if particular State wants a transplant	1	Particular State would assume lead role with Team's support
Double cost estimates in A&B - Section 11	1	Team feels costs are adequate
Accumulate more than 5 wolves	1	Good idea, if more than five can be accumulated quickly enough



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Attempt to condition wolves to avoid traps and poisons	1	Good research project, however, too detailed for Plan
Supports sanctuary areas	5	No comment
Proposes mediation board to advise on settling disputes in wolf management	1	Team felt this could be an important step in actual implementation
Wolf population dynamics model for Minnesota	1	This could be produced as specific item under III in Plan
Need rationale for caribou introduction	5	Valid - will expand on the caribou rationale in the narrative
What will closing or adjusting the Minnesota deer season do?	4	Covered in Appendix C
The problem is <u>habitat</u> and emphasis should be on improving <u>habitat</u>	5	Plan recognizes this
A deer population of 10 per square mile does not agree with Mech's correspondence on PP 37, App. C - (draft plan) 10 deer per square mile is greater density than recommended for sanctuaries (8/mi.)	2	No longer appropriate in revised Plan
Prey species other than deer, moose and beaver which occur in other parts of the historic range should be addressed	9	Any proposed reintroduction will be based on a complete ecological analysis. See Item 21 as covered in Plan
What could be the possible effect on human health of a transplant	2	Rabies - Echinococcus
Question primary objective of Plan.	1	Obtaining objective would result in declassification
a) Suggest primary goal should be declassification		
b) Reestablishing population <u>outside</u> of Minnesota should be primary objective	4	We consider this only part of the Plan
c) Believes primary objective should be at least one natural population	1	We consider this only part of the Plan



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Critical habitat determinations should include actions permissible and prohibited within the critical habitat zone	3	
a) Define restrictions	3	See revised narrative on critical habitat in Plan
b) Would reestablishment of release sites be considered for designation as critical habitat	3	To be determined
Will there be a conflict for food between the coyote and wolves that may be introduced?	1	May be a conflict, but will be evaluated - See Item 215
States should be consulted prior to (possible) reintroduction	3	Covered under item 222
Impact of wolf introduction should be considered	1	Covered in Plan - Item 215
What provisions for follow-up - tracking system, recaptive, replacement of batteries in transmitters, etc.	1	Covered under monitoring items in Plan
Costs of Plan high	1	Introduction modified to explain costs and benefits
Use soil information for habitat improvement actions	1	Plan assumes this
Determine carrying capacity of the range for deer and moose	2	Research and surveys proposed will provide an estimate of carrying capacity
How would wolves be removed in Zone 3 if deer numbers decline below those necessary to support one wolf/10 sq. mile? Who should make this decision?	1	Team recommends how and when wolves will be removed
Goal of maximizing moose populations rather vague	1	Plan cannot become too detailed



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Moose - wolf - human interactions in Zone 1-2-3 should be considered	1	Covered in revised Plan, Item 122-83
Critical habitat for wolf in Plan describes the most serious long term threat to Minnesota wolf populations - permanent changes in land use patterns which increase human population in Zone 1-2-3	3	Concur
Pay for predation losses	5	Unfavorable experience elsewhere indicates this to be inappropriate
Michigan and Wisconsin should enhance and protect existing wolf populations by restricting harvest of other species	3	Plan revised to cover, see Item 25
What degree of local support by what interests is needed for reestablishment?	1	To be determined locally
Allow for EIS in timing and budget	1	Determined by individual agency
Give more emphasis to taxonomic question	2	The taxonomic question is being studied.
Would removal of protection outside the primary range (sanctuary) decrease opposition to total protection within?	2	To do so would not be in the best interest of the animal
Prorate or assign some habitat improvement costs to the benefit of hunters, timber management, and other resources	1	Introduction to Plan modified to explain
Consider every possibility in preference to "government hunters"	2	Plan has such a provision except where and when more precise control is necessary
Voyageur National Park should be treated as Isle Royale National Park	1	Under revised Plan this would be no different from Zone 1 and need not be considered separately



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Techniques to achieve goals are not detailed	3	Team was to select broad goals, and not specific details
The charge of the Team not given	1	Added to revised Plan
Need to develop habitat and wolf management programs in wolf re-establishment areas	2	Added to revised Plan
Political and social factors considered over biological considerations	4	See Preface
Biological considerations considered over political and social considerations	1	See Preface
The Minnesota DNR should be listed as lead agency for caribou introduction	1	Corrected in revised Plan
Is the entire Upper Peninsula of Michigan potential wolf range as described	1	Biologically, all but a small part of the Upper Peninsula may be considered potential wolf range
How will the Plan affect the Indian right to hunt free of State control	2	This must be legally determined
Lack of public involvement may be detrimental to Plan	3	See Preface and Item 121-3
Relationship between Canadian and United States wolf population not explained	2	Team did not believe much detail was required
What is suitable habitat for wolves	2	See "Critical Areas" and "Critical Factors" sections
Discuss local ownership in primary range to aid in assessment	1	See revised Plan



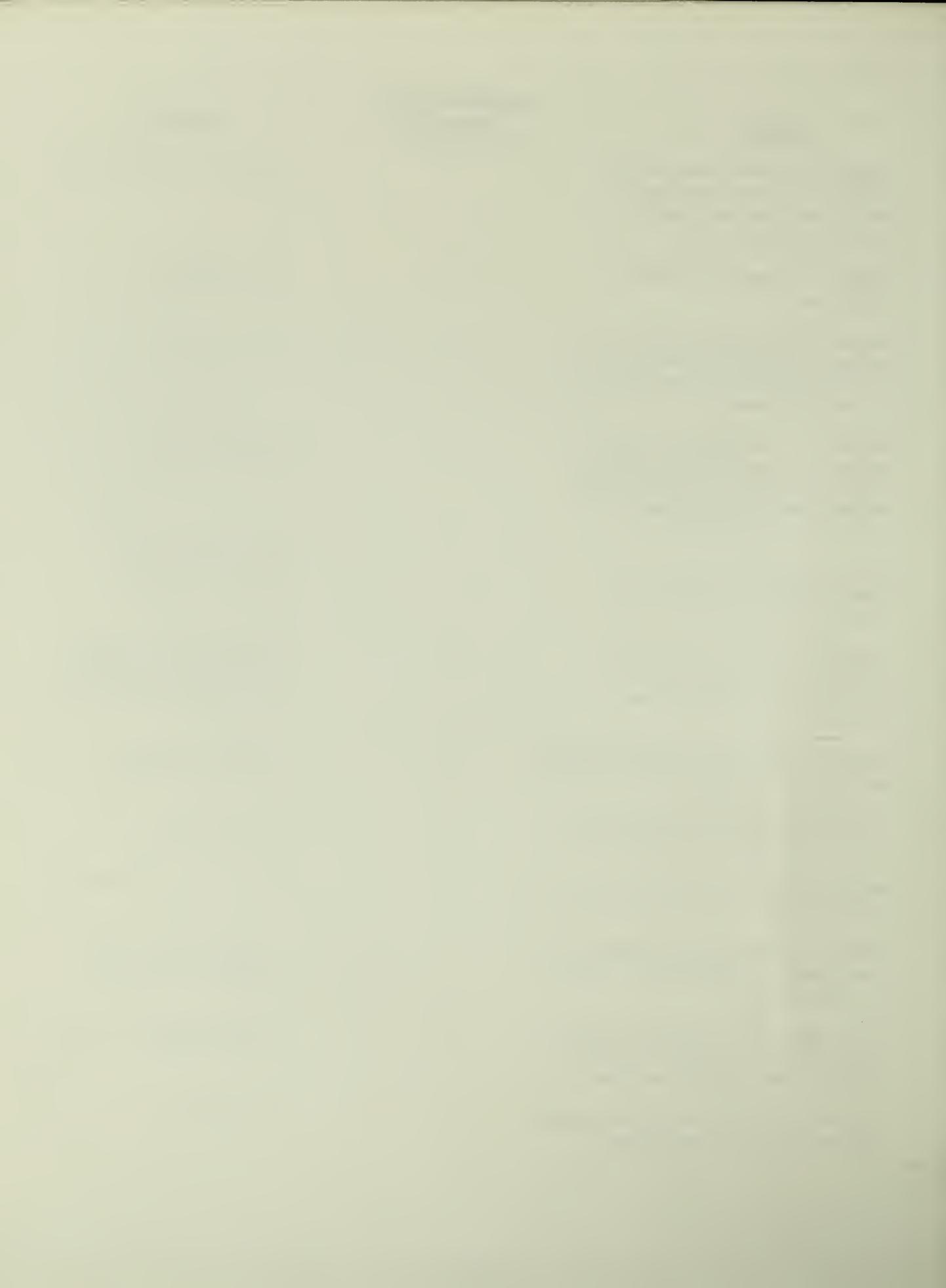
<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Address the Plan to protecting and improving the carrying capacity of the wolf	1	Team feels this is adequately covered by the Plan
At Isle Royale, include research into habitat	1	Given in Item 3-33
Have several conferences for explaining wolf ecology	1	Included in revised Plan
Mention laws and responsibilities to strengthen law enforcement	2	Is part of implementation not in Plan
Plan is inconsistent in amount of detail provided	1	Team concurs but provided detail to clarify certain sections
Strengthen Critical Habitat section by identifying additional critical elements	1	See revised Critical Area narrative
Believe wolf is neither "endangered" nor "threatened"	2	Team disagrees. See Recommended Classification
Believe additional studies and expenditures of funds on the wolf are unnecessary in Minnesota	2	Team disagrees
Extensive deer habitat improvement may be necessary in Zone 3	1	The Plan includes this provision
Suggests including the Northwest Angle in Zone 4	1	The Plan includes this
Supports control of wolves killing domestic animals	5	Team concurs
Propose farmers have the right to protect their domestic animals from wolves	1	Team believes control over taking of animals must be controlled
Feel that a strong I & E effort will be necessary to insure success of new release and for proper management in Minnesota	6	Team concurs



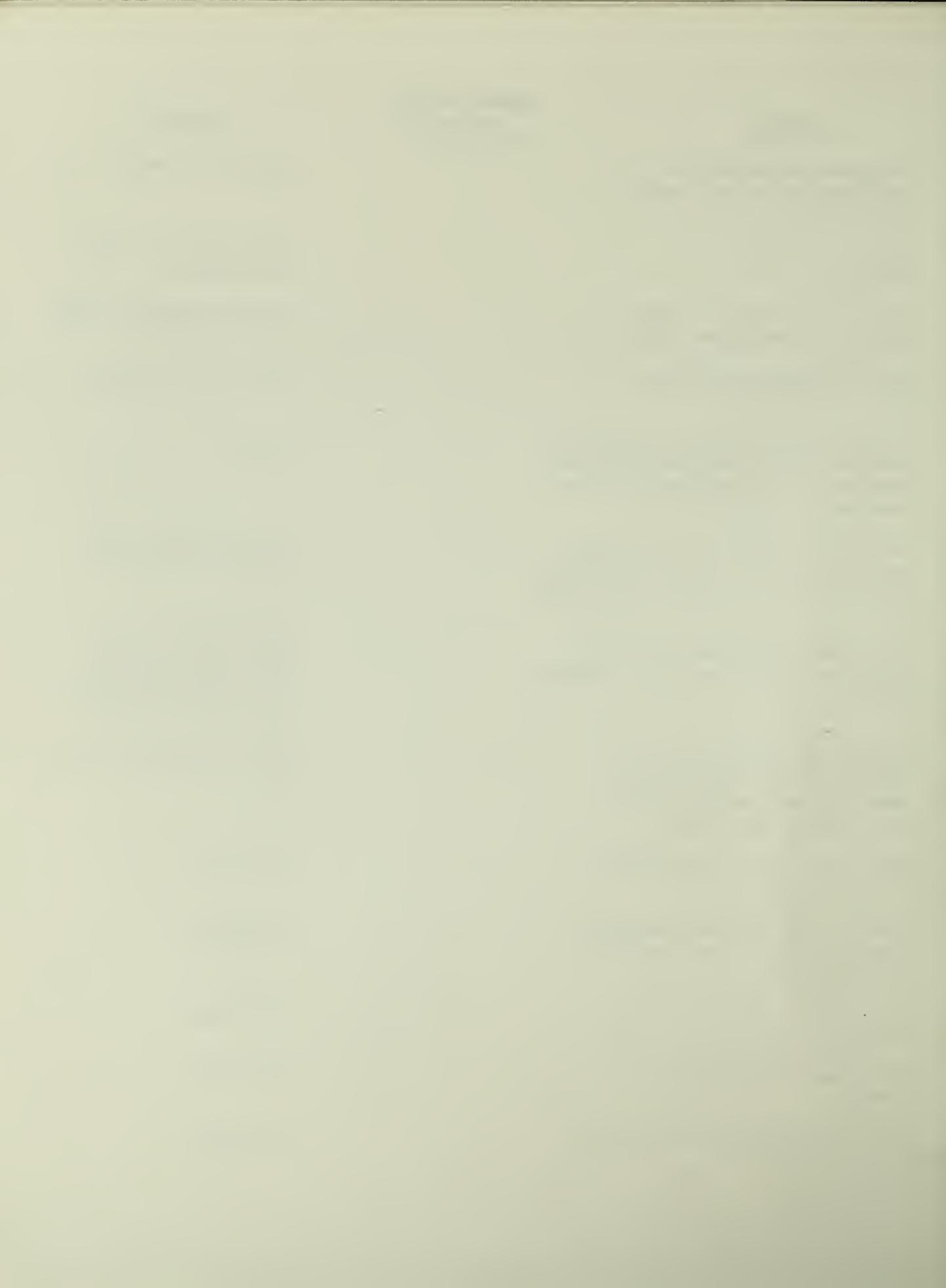
<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Agrees that wolves should not be allowed to increase beyond ability of prey to support them	1	Team concurs
Feels farmers should have the right to kill wolves killing their livestock	1	The Team believes control by Government control agents is preferable - see Item 122-23
Species should be either classified as "endangered" or "threatened" or not at all, regardless of State it's in	1	No comment
Population goals for predator is exceedingly difficult to check because censuring is very difficult	1	Difficult but possible
Land ownership complex - objectives of owners might be different from Plan	1	True
Establishment within former range is incomplete in the Plan	1	Reestablishment in all of former range is not feasible
Questionable that sufficient funds will be developed for cutting and burning needed and that great opposition can be avoided in such activities in important recreation area	1	No comment
Needs to be some assurance that monitoring wolf, deer and depredations on livestock will be continued	1	This is assumed
Agree with necessity to maintain a reduced wolf population in peripheral zone	1	No comment
Plan should state explicitly what hunting methods would be permitted and emphasize prohibition of poisons, snaring, and shooting from aircraft	1	Poisoning, snaring and shooting from aircraft are illegal in Minnesota
Since coyotes probably are being trapped, wolf trapping may need to be permitted, too, but best method for controlling wolf numbers would be to restrict wolf kill to shooting during fall deer season	1	Team disagrees



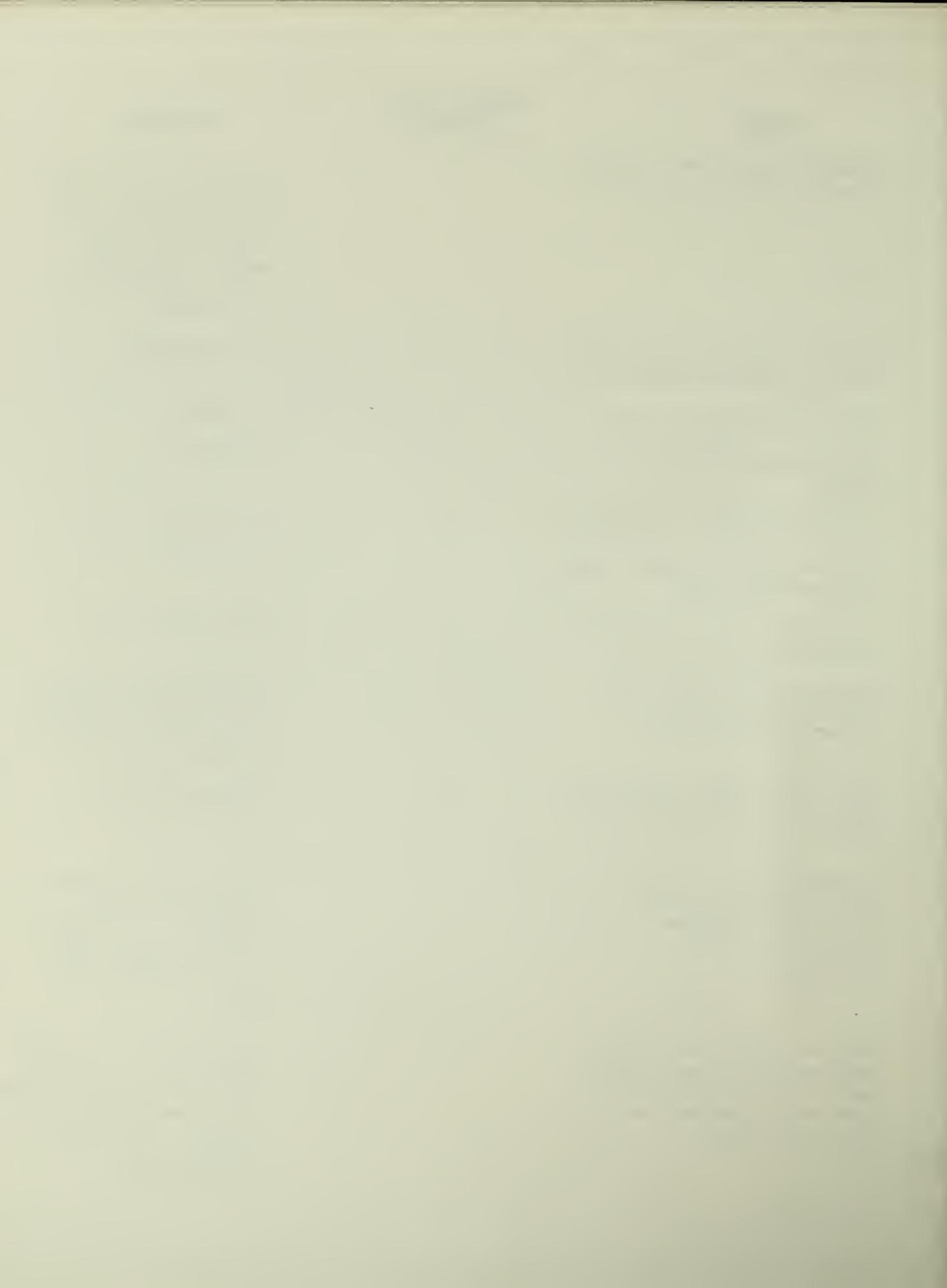
<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Needs to be some system for marking legally taken wolf pelts, so they can legally enter wolf pelt market	1	This will be possible
Support concept of caribou transplant	2	Team concurs
Support regulation of prey harvest when population levels fall, indicating a necessity for wolf recovery	1	Team concurs
Wolves do, indeed, pose real threat to some human activities. Over-protection in some areas could cause undue increase of hostility toward wolf	1	Team concurs
Primary objective on page 8 (draft plan) has goals too broad, political and costly	1	Team disagrees
Nowhere is there an adequate ecological discussion of reasons for reestablishment	1	See Critical Factors. Ecological studies are called for in the Plan
Should reconsider reestablishment as impractical	1	Team disagrees
Justifications for many actions are inadequate	1	No comment
Wolf sanctuary is not justified well enough	1	See "Critical Factors"
Wolf population should seek its own level in sanctuaries - i.e. no optimum goal	1	Team disagrees for Zones 2 and 3, but agrees for Zone 1
Area requiring treatments under Items 122-112-1, 2, 3 & 122-122 (draft plan) should be given	1	Not within the scope of the Plan
122-31 (draft plan) may be beyond the scope of the agencies	1	No comment



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Can prey populations be monitored accurately over large areas	1	Accurately enough
Not enough detail in 223, 224	1	Not within the scope of the Plan
Should cite Stenlund (1955) and Van Ballenberghe (1974)	1	Van Ballenberghe (1974) in revised Plan
Van Ballenberghe and Mech not in Bibliography	1	Included in revision
Minnesota would welcome Endangered Species funding for habitat management but not to detriment of other endangered species	1	Concur
Increasing wolves in NW sanctuary would increase livestock depredation problems and reduce deer herd there	1	Plan provides checks on this
NE sanctuary should be inviolate to prevent confusion - i.e. no taking of wolves even for livestock control	1	Team believes that where proven losses of livestock occur, the offending animals should be eliminated
Recommends clarification of chronology of habitat management programs, wolf control, and closing deer season	1	Plan revision has done this
Land use trend in NE Minnesota is toward protection	1	No comment
Plan's objective seems to be to justify reclassification to "threatened"	1	No comment
Surprised to find a minority report	1	No comment
Sympathetic with minority opinion	1	No comment
Public opinion sections need more feedback	1	No comment



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Only one person from Minnesota represented on Team	1	The Team was to be an autonomous group and not expected to represent any area or agency. Three Minnesota residents are on the Team
Disagree with total protection except in BWCA and Voyagers Park	1	Team disagrees
Close deer season one year	1	No comment
Investigate protectionist groups	1	No comment
Stop cutting cedar in deeryards	1	No comment
Stop herbiciding forests, road sides and powerlines	1	No comment
Are 1,520 wolves necessary to insure survival of species	1	Approximately, yes
Manipulation of habitat contradicts goal of naturally fluctuating population	1	Manipulation of habitat is considered essential where goal is maximum wolf population
Items 123-1, 123-4, and 123-44 (draft plan) contradict each other	1	Not appropriate to revised Plan
Recommendation to create openings contradicts recommendations against permanently removing forest cover	1	Small forest openings are assets to prey species. A permanent removal of the forest for floodings, mines, etc., is a different matter
What are the jurisdictional, administrative, and economic aspects of introducing wolves into territories not now occupied by wolves	1	Introductions into other States will, of course, have to have the approval of the appropriate State agencies. Economics, etc. will be a part of the advance studies.



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
What type of continuing censuses of wolves and prey species will be established to serve as a basis for future proposed management judgments and practices?	1	This will be handled largely by cooperative efforts between State and Federal agencies. The type of censusing will vary as needs dictate
How do you intent to extensively improve habitat over vast areas which are inherently less productive than others?	1	See Item 122-22
Have you considered adequately the effects of removing the wolf from the "threatened" or "endangered" lists in the lower 48?	1	Team is not proposing removal
We wonder about the economics, practical and biological impact of expanding wolf populations into vast areas that would require tremendous costs	1	These things will be further considered for each potential release area
Is it desirable to try and maintain a wolf density of 1/10 <sup>3</sup> mile? Would it be easier to maintain a population of 1/20 <sup>3</sup> miles which would probably result in less wolf-people conflicts?	1	Team directed to develop the recovery Plan based on biological considerations - other consideration to be made by agencies responsible for the actions
Are caribou habitat requirements similar to that required by deer and moose?	1	To be determined
In order to repatriate wolves, a very large land block would have to be closed to trapping and some kind of hunting. It is doubtful that hunters and landowners would agree	1	Issue partially addressed in revised Plan - See Item 25



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
A mass transfer of wolves from one region to another appears unacceptable because of possible genetic consequences	1	Team is aware there may be some taxonomical differences and this is address in revised Plan - See Items 21 & 22
Suggest adopting a non-management alternative by keeping Man out of the wolves' territory rather than claiming the land as Man's territory and moving the wolves out	1	This may be ideal, but not realistic because Man has already invaded the wolves present domain
Recommendation by team to re-classify the Eastern Timber wolf as a "threatened" species runs counter to the basic assumptions of the Endangered Species Act of 1973. Act was created to insure protection of endangered species throughout the U. S. and the world.	1	Changes in status do not reduce legal protection. If species is classified under the Act as being either "endangered" or "threatened", it is afforded the same protection under the Act.
The purpose of the Recovery Team is also to participate in protection and restoration of a species to a point where the species is no longer "endangered" or "threatened". To deplete the last remnant population of wolves is contrary to the mandate of the Recovery Team	1	The Team has not recommended this
Concurs with reintroduction to suitable areas, but thorough action for planning, consultation, and public relations should be targeted a year or two in advance	1	Team concurs
Recovery Plan should devote more discussion to funding, education, and local action prior to re-introduction	1	Plan does address these items in a general manner. When a State makes the initial decision to re-introduce, these items should be addressed specifically and in detail



<u>COMMENT</u>	<u>NUMBER OF SUCH COMMENTS</u>	<u>RESPONSE</u>
Should provide adequate law enforcement to protect wolves. Should be the highest priority	1	Plan addresses enforcement effort. See Item 122-7
Recovery Plan condones illegal taking of 60 wolves	1	The 60 wolves' figure was an estimate based on knowledge gathered over the past two years. The Team <u>does not</u> condone illegal taking of wolves and would expect the number to drop with additional law enforcement effort. We are simply taking into account the illegal take that does, unfortunately, occur



## APPENDIX F

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